Complication of Laparoscopic Cholecystectomy

R.K. Mishra
What to do if something goes wrong

There is not a single laparoscopic surgeon in the world who has not damaged CBD
Complications

Early
- Common bile duct injury
- Bile leak
- Injury to viscera
- Hemorrhage
- Retained stones and abscess formation

Late
- Biliary strictures
- Cystic duct clip stones
Lap Chole and CBD injury

- Incidence of iatrogenic CBD injury is 0.12% & 0.55% during open and laparoscopic cholecystectomy respectively.

- Most common cause of CBD injury is:
  1. Misinterpretation of anatomy 70% 
  2. Technical Errors 
  3. Risk factors
Normal Anatomy

Gallbladder and extrahepatic bile duct sectioned. Knowledge of Anatomy of Calots triangle is essential for a safe lap chole operation.

- Dr. R.K. Mishra

- Gallbladder and extrahepatic bile duct sectioned. Knowledge of Anatomy of Calots triangle is essential for a safe lap chole operation.

- Right hepatic duct
- Left hepatic duct
- Common hepatic duct
- Infundibulum (Hartman of gallbladder)
- Neck of gallbladder
- Spiral part of cystic duct
- Body (corpus) of gallbladder
- Fundus of gallbladder
- Common bile duct
- Descending (2nd) part of duodenum
- Gland openings
- Major duodenal papilla (of Vater)
- Ampulla (of Vater)
- Pancreatic duct
- Common bile duct
Variation in Cystic Artery I

Double cystic artery; both from aberrant right hepatic, one inside and one outside cystic triangle.

Variation in cystic artery often encountered at the time of lap chole.
- Dr. R.K. Mishra

Double cystic artery; both from normal right hepatic, one inside and one outside cystic triangle.
Variation in Cystic Artery II

Variation in cystic artery is often found at the time of lapchlope. May originate from intermediate (or left) hepatic. May originate from proper hepatic. May originate from gastroduodenal.

Dr. R.K. Mishra

May cross anterior to hepatic duct. May cross anterior to common bile duct.
Variation in Cystic Artery III

Variation in cystic artery is many and often found.

- May originate in cystic triangle from aberrant right hepatic (from superior mesenteric).
- May originate outside cystic triangle from aberrant right hepatic.

Dr. R.K. Mishra

Superior mesenteric artery

May cross anterior to hepatic duct.
Variation in Cystic Artery IV

All these variations in cystic artery should be remembered. Dr. R.K. Mishra.

Double cystic artery; posterior from right hepatic, anterior from gastro-duodenal.

Double cystic artery, both from normal right hepatic in cystic triangle.
Variation in Cystic Duct

Variation in cystic duct - Dr. R.K. Mishra

- Low union with common hepatic duct
- Adherent to common hepatic duct
- High union with common hepatic duct
- Cystic duct absent or very short
- Anterior spiral joining common hepatic duct on left side
- Posterior spiral joining common hepatic duct on left side
Right hepatic variation

75% Posterior

25% Anterior
Accessory Cystic Ducts
Accessory Cystic Ducts
Duct of Luschka
Duct of Luschka

The dissection of the gallbladder bed must be performed carefully to allow for the identification of any accessory biliary ducts draining directly into the gallbladder from the liver. Any such accessory ducts identified during the dissection of the gallbladder bed must be clipped.
Most Dangerous Gallbladder

superior view

inferior view
Fundus First
Difficult Cholecystectomy
Knotting
Extraction of Stones
Separation from Liver
Complication

Injury to right hepatic artery
Injury to the CBD
Lateral Clipping of CBD
Traumatic Desinsertion of Cystic Duct Junction
Electrical Injury
Technical Errors

- Most important technical error is hilar bleeding & frantic attempts are made to control bleeding by electrosurgery.
- In case of bleeding
  - First apply pressure
  - Take suction irrigation and atraumatic grasper
  - Use electro surgery only when bleeder point is identified
Injury by Instruments

The maryland dissector has a convex border as the Cystic artery is just posterior to the Cystic duct the convex border can bite the Cystic Artery on complete closer.
How to avoid injury?

- Try to memorise initial anatomy of Calot's triangle
- A large distended Gall bladder should be aspirated
- Antero-lateral traction is better than fundus pull
- Avoid meticulous dissection by energized instrument
- Skeletanization through pledget is better
- During detachment of gallbladder from liver bed maintain plane of adipose tissue
- Use Suction Irrigation frequently
Bleeding Cystic Artery
What to do if something goes wrong

- Type of CBD Injury
  - **BISMUTH CLASSIFICATION**
    - Type 1 - CHD stump > 2 cm.
    - Type 2 - CHD stump < 2 cm.
    - Type 3 - Hilar, Rt. & Lt. duct confluence intact
    - Type 4 – Hilar, separation of Rt. and Lt. ducts
    - Type 5 - Injury to aberrant Rt. duct ± CBD injury
Strategy to handle complication recognized intra operatively

- For high complete transaction Roux-en-Y hepaticojejunostomy
- For lower complete injuries primary suture repair over T tube
- Long end of T tube must not be exteriorized from same site
- For partial injuries Insertion of T tube & Roux-en-Y serosal patch
Strategy to handle complication recognised post operatively

- USG + ERCP + MRCP
- Fluid + Electrolyte + systemic antibiotic
- Conservative treatment & biliary drainage for 6 weeks by ERCP stent insertion or
- PTBD (Percutaneous trans hepatic biliary drainage) if Endoscopic stent application is not possible
- After Several weeks Reconstructive surgery
- Roux-en-Y Choledocoduodenostomy or Hepatojejunostomy
Mirizzi Syndrome

- Mirizzi syndrome is a rare benign cause of obstructive jaundice. This syndrome, first described by Pablo Mirizzi (Argentina) in 1948, is mainly caused by a stone impacted in either the Hartmann's pouch or the cystic duct, causing obstruction of the common hepatic duct by extrinsic compression.

- It occurs in 0.7% to 1.4% of the patients undergoing cholecystectomy.
Lap Chole in Mirizzi Syndrome

- Type I is characterized by simple external compression of the common hepatic duct.
- Type II is defined by the presence of a cholecystocholedochal fistula.

*Laparoscopic Cholecystectomy by Fundus first is possible for Mirizzi type I, Type II with fistula should better dealt with open technique.*
Thank you

Advance Course February 2005