



Critical Strategies for Safe Laparoscopic Cholecystectomy

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Editorial

Laparoscopic Cholecystectomy (LC) is one of the most commonly performed operation world wide. Before the routine use of laparoscopy, the incidence of Major biliary injuries were approximately 0.2% in open cholecystectomy [1]. After the acceptance of LC as a gold standart surgical approach for cholelithiasis, the incidence of biliary injuries were doubled. Many factors are related with such injuries including obesity, cholecystitis, malegender, variations in anatomy e.t.c. The most common cause of biliary injury is misidentification of important anatomical structures. Usually, overtraction of infundibulum is associated with alignment of common bile duct to cystic duct. Thus common bile dust is clipped as a cystic duct and cut. After continuing dissection lateral to the common bile duct, common hepatic duct is also clipped in hilum of the liver. Right hepatic artery may also be injured. This is the classical mechanism of major biliary injury.

Biliary injuries during LC is still an important problem and many attempts were performed to decrease these complications. Bile leaks and peritonitis, bile duct strictures with cholangitis, sepsis, cirrhosis, liver failure are all consequences of such injuries. Mortality rate is high with these complications. Anational survey from Italy detected an incidence of 0.42% of major bile injuries during LC in 56 591 patients. The risk was higher in patients with cholecystitis and low-volume centers [2]. A safe cholecystectomy technique is particularly important. Strasberg in 1995, first suggested a surgical technique called the "Critical View of Safety" (CVS), to decrease the risk of bile duct injuries [3]. In fact, a correct CVS should have three successful steps:

1. Meticulous dissection of the Calot's triangle from all fatty and fibrous tissue.
2. Lowest part of gallbladder should be separated from the cystic plate, which allows the visualisation of posterior liver bed.
3. Dissection and identification of only two structures (cysticduct, cysticartery) entering the gallbladder. Most of the time exploration of common bile duct is not mandatory.

CVS technique was used succesfully in many centers. Avgerinos et al. [4] reported on 1,046 patients having laparoscopic cholecystectomy. A total of 998 patients were operated with CVS technique. The conversion rate was 2.7%. There were 5 minor bile leaks without any major bile duct injuries [4]. In our clinic, CVS technique is standart part of LC were ported 120 cases without any biliary complications with CVS technique [5]. As a medico-legal issue basic parts of CVS should be added to operation notes. The photographic documentation of CVS is also encouraged. Anybiliaryinjuryandrepairshouldalso be explained in operation notes. Although CVS is an useful technique in LC, some other suggestions and technical notes can be found in literature. SAGES (Society of American Gastrointestinal and Endoscopic Surgeons) introduced a safe cholecystectomy program. To minimize the biliary injuries 6 strategies were suggested:

1. Critical View of Safety (CVS) method should be used including 3 basics approach; Calot's triangle should be cleared of fat and fibrous tissue, the lower one third of the gallbladder is dissected from the liver to expose the all anatomical structures and cystic duct and artery should be isolated.
2. Intra-operative time-out prior to clipping, cutting or transecting any ductal structures is advised.
3. Variations in anatomy should be considered in all cases.
4. Surgeon should use cholangiography or other instrument for demonstrating biliary anatomy.
5. In case of difficulty to expose biliary anatomy alternatives urgical techniques such as partial cholecystectomy, cholecystostomy tube placement or conversion to an open procedure can

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be beneficial.

6. Consultation with another surgeon in difficult cases may be helpful.

As a relatively high volume center, we can add some practical suggestions for safe cholecystectomy. The essential part of safe LC is absolute identification of anatomical structures before any surgical intervention including usage of electrocautery, clipping and cutting. The high quality image producing laparoscopic equipments were advised with 30° camera. Electrocautery should be used minimally in Calot's triangle and structures near to the common bile duct. Dissection should begin near the neck of the gallbladder and proceed from the lateral to the medial direction, always staying close to the gallbladder. Clips should be placed close to the gallbladder for cystic duct or cystic artery. A wide, inflamed cystic duct can be closed with ligation, simple sutures or staples. All structures should be clipped or cut only after completely (360-degree) encircled. Routine intraoperative cholangiography is not suggested. It should be considered especially in case of uncertain biliary anatomy, suspicious or obvious injury of the bile ducts. The surgeon should be familiar with technique and interpretation of intraoperative cholangiography. Safe cholecystectomy is an important issue. CVS technique with other major suggestions mentioned in this manuscript can minimize bile duct injuries during LC.

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