

Bile Duct Injury During Laparoscopic Cholecystectomy

In the lead article in this month's issue, Davidoff and colleagues describe the patterns of injury of the extrahepatic biliary tree that occur during laparoscopic cholecystectomy. They show how mistaking the common bile duct for the cystic duct can lead to the most common kind of injury: resection of a segment of the common bile duct, often accompanied by injury to the right hepatic artery. The cause of this lesion is misinterpretation of the anatomy, where the common duct is thought to be the cystic duct. The second most common cause of ductal injury is hilar bleeding; as attempts are made to control bleeding, adjacent structures can be injured by the electrocautery, laser, or hemostatic clips.

The most critical issue raised by these cases concerns prevention. In an earlier article, Meyers and fellow members of the Southern Surgeons Club¹ reported that the rate of bile duct injury was 2.2% during a surgeon's first 13 laparoscopic cholecystectomies, but it dropped to 0.1% in subsequent cases. Data from the current study corroborate that finding; 10 of the 12 biliary injuries occurred during the surgeon's first dozen or so cases. These findings suggest that at present most biliary injuries are related to inexperience and are theoretically avoidable. They also suggest that the recommended privileging guidelines for laparoscopic cholecystectomy, which call for an experienced laparoscopic surgeon to serve as assistant during a surgeon's first three to six laparoscopic cholecystectomies, either have not been followed or are inadequate. The purpose of the proctoring recommendation is to minimize the risks of inexperience, and there is every reason to expect that it should prevent bile duct injuries. The observation in both studies that the steepest part of the learning curve comprises the first 12 cases could be interpreted to suggest that proctoring should now be increased to the surgeon's first 12 cases.

Hunter² recently proposed five technical steps aimed at preventing bile duct injuries during laparoscopic cholecystectomy: 1) promoting liberal use of the 30° angled laparoscope, because it provides a more perpendicular view of the hilar structures; 2) using firm cephalad retraction on the fundus of the gallbladder, which exposes

the hilar structures; 3) having the first assistant retract the infundibulum of the gallbladder laterally instead of parallel to the common duct to separate of the cystic and common ducts; 4) dissecting the cystic duct continuously into the gallbladder; and 5) converting to an open cholecystectomy whenever bleeding becomes more than a minor problem. I would add the following items to that list: 6) using a cautery device with suction/irrigation capabilities because it allows the surgeon to keep the operative field much cleaner; 7) using caution when interpreting cholangiogram findings because it may be more difficult than anticipated to recognize when the cholangiogram catheter enters the common duct rather than the cystic duct; 8) always assuming that the common duct is occluded when it does not opacify; and 9) never using the cautery, laser, or clips blindly to control bleeding. In general, however, I believe that most duct injuries that occur during laparoscopic cholecystectomy can be avoided by more thorough proctoring of neophyte laparoscopic surgeons, more liberal (routine) use of cholangiography, and a greater willingness to convert to open cholecystectomy when the dissection becomes bloody or is otherwise difficult.

Laparoscopic cholecystectomy has only been performed widely in the US for about 2 years. In a sense, it is fortunate that specific information on bile duct injuries has become available so soon, because it provides clear directions for prevention. Davidoff and colleagues have performed a commendable service. It is now critical that those engaged in laparoscopic surgery use this information and do everything practical to minimize the frequency of this serious complication.

Reference

1. The Southern Surgeons Club. A prospective analysis of 1518 laparoscopic cholecystectomies. *N Engl J Med* 1991; 324:1073.
2. Hunter JG. Avoidance of bile duct injury during laparoscopic cholecystectomy. *Am J Surg* 1991; 161:71.

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