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Identifying the Mirizzi's syndrome intraoperatively by "tree trunk shaking metaphor" during laparoscopic cholecystectomy for acute cholecystitis

Dear Editor-in-Chief,

Early cholecystectomy is recommended in the management of acute cholecystitis. Laparoscopic cholecystectomy is the gold standard method. However, in emergency surgery, bile duct injury is one of the most common complications. Although numerous surgical techniques have been described for safe cholecystectomy, the most important issue is to identify cases that may lead to complications during the intraoperative period and apply the appropriate bail-out strategy (1).

Mirizzi syndrome is one of the most common anatomical variation leading to complications, especially biliary duct injury (2) (Figure 1).

For this purpose, we aim to present an easy concept for identifying Mirizzi syndrome intraoperatively using the "tree trunk shaking" metaphor. According to this proposed metaphor, the gallbladder is held at the beginning of the operation using a laparoscopic grasper from the fundus. In a case of an anomaly, when the grasper holding the fundus is pulled to the right or left, it can be seen that the gallbladder and attached biliary duct, most likely the main biliary duct, move as a single block, like as if a "thick tree trunk were shaking," up to the duodenum. In this situation, we assume that there is a high probability that a type of Mirizzi syndrome is present (Figure 2).

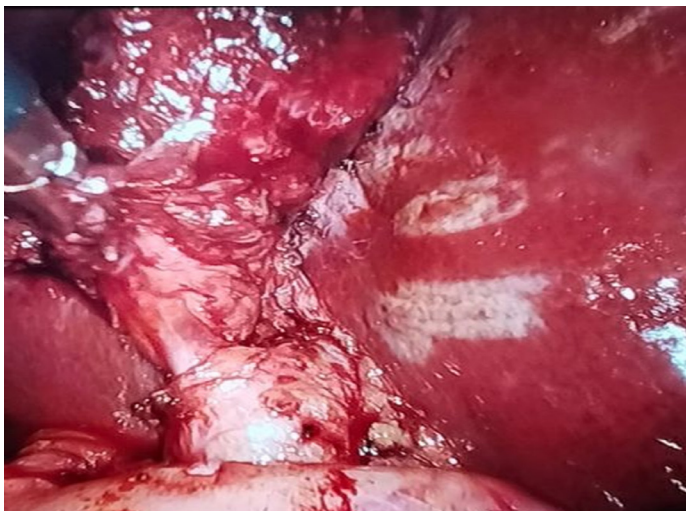


Figure 1. Laparoscopic view of Mirizzi's syndrome

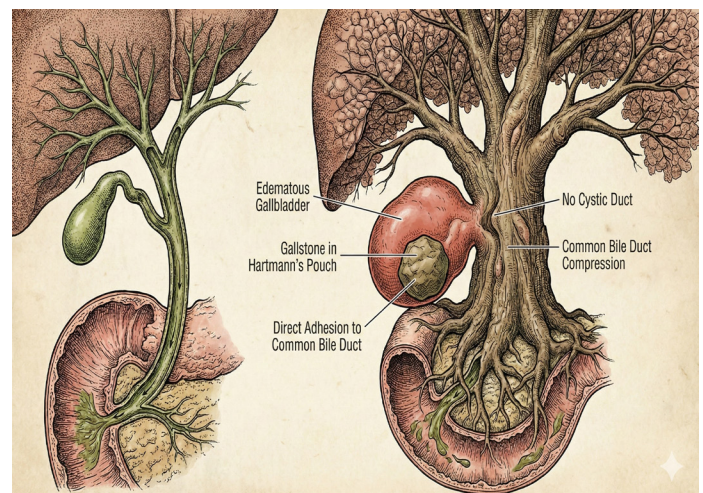


Figure 2. Left figure: Normal biliary anatomy; right figure: "Tree trunk shaking metaphor" in Mirizzi's syndrome

Due to the existing cystic duct-choledochal junction anomaly, the cystic duct cannot be identified during the hepatocystic dissection, and the anatomical structures—including the cystic duct, cystic artery, and the relationship between the cystic duct and the common bile duct cannot be visualized clearly within the borders of the hepatocystic triangle. In this situation, we recommend that the surgeon perform a bail-out surgery such as subtotal cholecystectomy, which is the most commonly applied procedure, if they do not have advanced training or sufficient experience in hepatobiliary surgery (3).

Mirizzi syndrome is an important anatomical variation due to chronic cholelithiasis that creates significant challenges during cholecystectomy, from dense inflammation to the formation of cholecysto-biliary fistulas. It is important to make a diagnosis before surgery, but it is not always simple. Imaging tests like ultrasound, CT, MRCP, and ERCP are used to find out how much the biliary system is affected, and it is important to correctly categorize the syndrome into different types based on the extent of bile duct compression and the possible enterobiliary fistula formation (4).

It is primarily classified by the Csendes system, which begins with Type I, characterized by external compression of the bile duct without a fistula. Types II through IV involve the progressive development of a cholecystobiliary fistula, ranging from partial erosion to the complete destruction of the bile duct wall, while Type V includes an additional connection to the bowel (cholecystoenteric fistula) (5).

With improved intraoperative imaging, enhanced laparoscopic techniques, and greater surgical experience, minimally invasive surgery is becoming increasingly feasible for selected patients with Type I and early Type II Mirizzi syndrome. In more complex cases, open surgery may be preferred to allow tactile feedback and meticulous dissection to manage the severe inflammatory changes and ensure complete stone clearance and fistula repair. Surgery appropriate to this concept, particularly subtotal cholecystectomy as a salvage operation in such cases,

can be preferred depending on the characteristics of the case, such as fenestration or reconstititional type (3).

In conclusion, in cases of acute or chronic cholecystitis where there is an edematous gallbladder, using the “tree trunk shaking” metaphor allows for the early intraoperative detection of Mirizzi syndrome-related anatomical variations, enabling the surgery to be performed in a much more controlled manner. So, a potentially fatal biliary injury, which could even lead to liver transplantation, can be prevented.

Conflict of interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

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