



CODEN [USA]: IAJPBB

ISSN : 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<https://zenodo.org/records/10589552>Available online at: <http://www.iajps.com>

Research Article

**DIFFERENCE BETWEEN OPEN AND LAPAROSCOPIC  
CHOLECYSTECTOMY****Adil Mahjoub Musa, Eman Ibrahim Abdalla Osman**  
Hafer Albatin Central Hospital**Abstract:**

**Introduction:** The removal of the gall bladder is one of the most frequent procedures and is known as cholecystectomy. The typical cholecystectomy surgery uses an open method. Patients typically had a 2 to 6-day postoperative in-house stay, and this typically involved undergoing an intraoperative cholangiogram. A less invasive surgical procedure called laparoscopic cholecystectomy removes a diseased gallbladder. For cholecystectomies, this method essentially supplanted the open method. The management of cholecystitis, symptomatic cholelithiasis, biliary dyskinesia, acalculous cholecystitis, gallstone pancreatitis, and gallbladder tumors or polyps is currently indicated by laparoscopic cholecystectomy. In managing acute cholecystitis, laparoscopic cholecystectomy has gained popularity as an alternative to open cholecystectomy. The ideal management of symptomatic cholelithiasis and chronic cholecystitis is now laparoscopic cholecystectomy.

**Aim of the study:** The purpose of this review is to understand the difference between open and laparoscopic cholecystectomy.

**Methodology:** The review is the comprehensive research of PUBMED since the year 2013 to 2022.

**Conclusion:** Regardless of the surgical approach employed, the indications that lead the surgeon to undertake a partial cholecystectomy are inherently vulnerable to problems. However, compared to an open treatment, a laparoscopic technique has benefits like a quicker recovery period and shorter hospital stay after surgery. It also has a lower risk of wound infection and incisional hernias. The surgical team should never hesitate to move to an open cholecystectomy, though, if they lack sufficient experience.

**Keywords:** Gallbladder removal, Open cholecystectomy, Laparoscopic cholecystectomy, etc.

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Please cite this article in press Adil Mahjoub Musa et al, **Difference Between Open And Laparoscopic Cholecystectomy**, Indo Am. J. P. Sci, 2023; 10 (09).

**INTRODUCTION:**

One of the body's anatomical regions with the most variations is the biliary tree. The gallbladder is a pear-shaped organ with no capsule. The distal gallbladder has a little protrusion at its distal end known as Hartman's pouch, which tapers to the cystic duct, which houses the Valves of Heister. At the intersection of the common hepatic (proximal) and common bile (distal) ducts, the cystic duct connects to the bile duct. At the Ampulla Vater, the common bile duct flows into the duodenum. The flow of bile into the duodenum is regulated by the sphincter of Oddi. The hepatic radicals (Left and Right) in the liver are formed by the proximal common hepatic duct.<sup>[1]</sup>

In the past few years, there have been substantial paradigm shifts in the management of acute biliary issues and acute cholecystitis. These modifications include cholecystectomy index admission and earlier operation. The need for open cholecystectomies has diminished since laparoscopic procedures became available. Converting from a laparoscopic to an open cholecystectomy is the most frequent reason (2% to 10%) for an open cholecystectomy. There are many explanations for this transition. Whenever the anatomy is in doubt, surgeons may switch to an open method. The need for an open operation is indicated in severe inflammation, adhesions, anatomical differences, bile duct injuries, retained bile duct stones, and uncontrolled bleeding. Symptomatic cholelithiasis, biliary dyskinesia- hypofunction or hyperfunction, acalculous cholecystitis, gallstone pancreatitis, and gallbladder masses/polyps are some examples of the laparoscopic procedure.<sup>[2,3]</sup> Since laparoscopic bile duct exploration can be challenging, the requirement for a common bile duct exploration may also be a justification for switching to an open surgery. In cases of cirrhosis, gallbladder malignancy, extensive upper abdominal surgeries with adhesions, and other concomitant diseases (particularly diabetic mellitus), a planned open cholecystectomy may be performed. Since an open procedure may be less stressful for critically compromised patients and prevent the physiologic changes associated with a surgical pneumoperitoneum (such as decreased cardiac return and higher ventilation pressures), situations involving critically ill patients may also call for the need for a planned open cholecystectomy. The

switch from laparoscopic to open surgery is frequently caused by poor visualization and ambiguous anatomy.<sup>[2,3]</sup>

**Equipment and Procedure**

If an intraoperative cholangiogram is required, fluoroscopy and cholangiogram catheters must be on standby. Additionally, equipment for a potential common bile duct exploration should be accessible, including a colonoscopy. To remove common bile duct stones, bile duct baskets, graspers, and Fogarty catheters are also necessary. When undertaking bile duct exploration, a variety of T-tubes are also necessary. Depending on the operational situation, self-retaining retractor devices like a Bookwalter may be useful. For laparoscopic surgery, two laparoscopic monitors, including the camera wire and light source, one laparoscope (5/10 mm, 0/30 degrees), source of carbon dioxide, and insufflation tubing trocars ranging from 5 mm to 12 mm (often three 5 mm functioning trocars and one 10 mm–12 mm trocar) the apical instruments A recovery bag, Maryland grasper, electrocautery (such as a hook or spatula), clip applier, and atraumatic graspers are included. It is necessary to have a scaler (11/15 blade), forceps, needle driver, absorbable sutures, and a large open tray for potential conversion to the open method.<sup>[4,5]</sup>

The diagnosis of gallbladder disease requires a comprehensive diagnostic workup. A gallbladder ultrasound is part of this diagnostic process, along with possible abdominal CT, Hida, and blood tests.<sup>[6]</sup>

**Open Cholecystectomy:**

Following the proper anesthesia and preparation of the patient, a right subcostal (Kocher) incision or upper midline incision is done. Utilizing packs and retractors allows for enough exposure. It's crucial to have a clear picture of the bile ducts, triangle of Calot, and gallbladder. To prevent liver damage from the retractor, care must be required. From the triangle of Calot up, or traditionally from the top-down, the decision is taken to remove the gallbladder. First, the cystic artery and duct are detected and split using hemoclips. It is essential to accurately identify these structures. The gallbladder can then be cut out of the liver's gallbladder bed using a harmonic scalpel or electrocautery.<sup>[7]</sup>

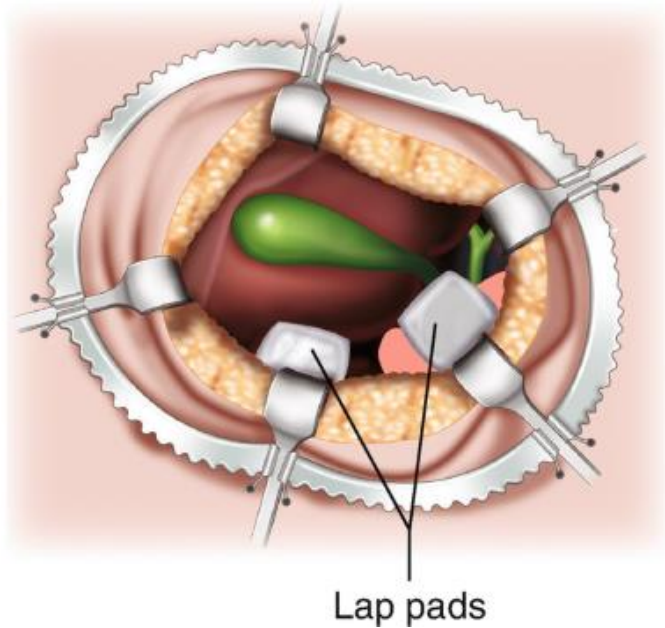
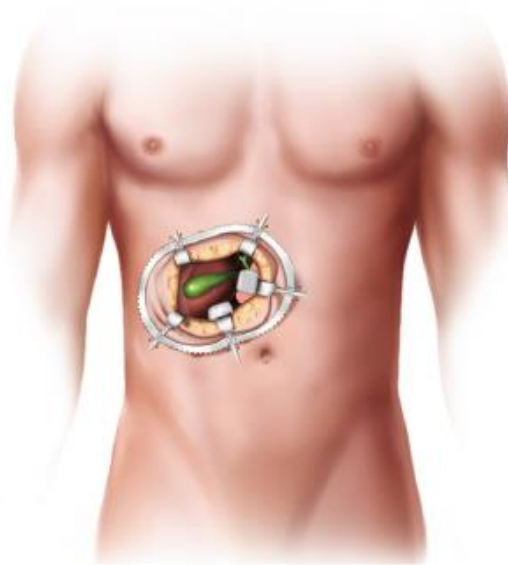


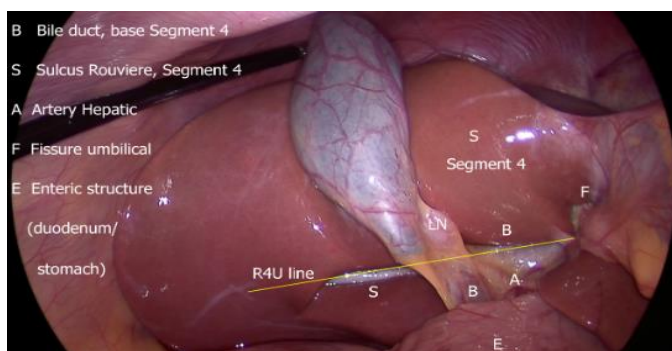
Figure demonstrating open cholecystectomy <sup>[8]</sup>

To locate and address any bleeding or bile leaks from the duct of Luschka, the gallbladder bed is examined. Common bile duct exploration, such as an operational cholangiogram, is dependent on conditions like high bilirubin and a dilated common bile duct (above 8 mm). The typical multilayer method of closure is then used on the abdomen. <sup>[7]</sup>

#### Laparoscopic Cholecystectomy:

First, carbon dioxide is used to inflate the abdomen to 15 mmHg. The next step is to make four minimal incisions in the belly (right subcostal, supraumbilical, and subxiphoid). The gallbladder is pulled back over the liver using a camera (laparoscope) and lengthy instruments. This enables the suggested hepatocystic triangle region to be

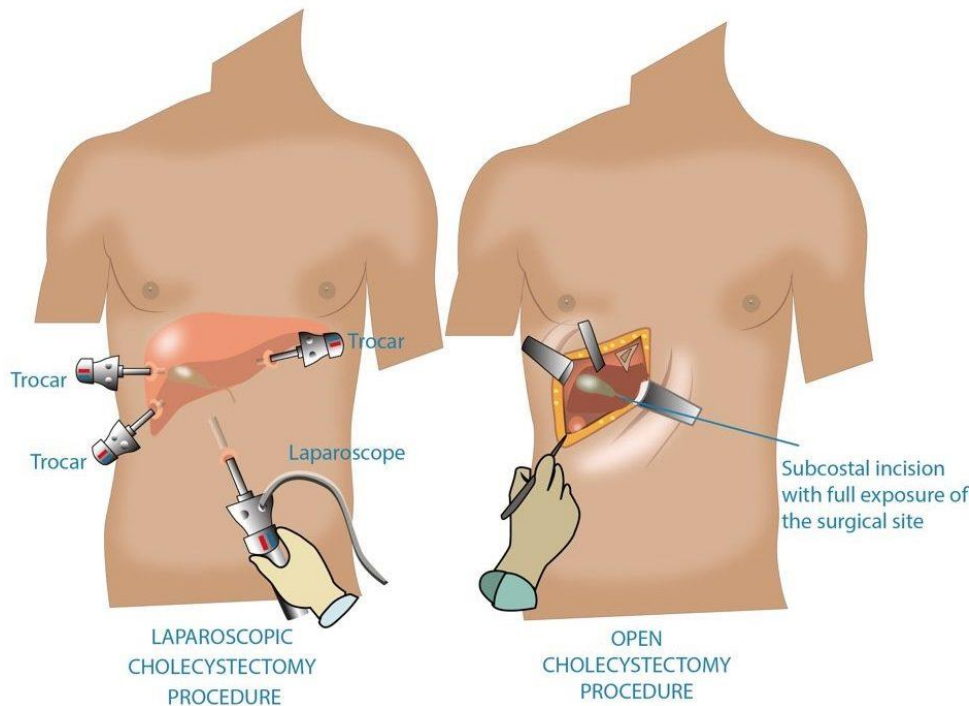
exposed. To reach the critical view of safety, careful dissection is done. A few characteristics of this view include the removal of fibrous and fatty tissue from the hepatocystic triangle, the presence of just two tube structures entering the gallbladder's base, and the separation of the gallbladder's lower third from the liver to reveal the cystic plate. The operating surgeon can move forward in confidence, knowing that the cystic duct and cystic artery have been successfully isolated once this image has been sufficiently obtained. Both structures are transected and cut with precision. The gallbladder and liver bed are then thoroughly separated using electrocautery or a harmonic scalpel. After the abdomen has been allowed to deflate to 8 mmHg for 2 minutes, hemostasis should be reached. <sup>[5]</sup>



Surgical exploration during laparoscopic cholecystectomy and the difference between open and laparoscopic cholecystectomy <sup>[10]</sup>

Using this method can help you avoid missing any potential venous bleeding that your elevated intra-abdominal pressure (15 mmHg) might tamponade. In

a specimen pouch, the gallbladder is taken from the abdomen. Remove all trocars while being directly observed. To prevent incisional hernias throughout the healing process, this author advises fascial closure of trocar sites larger than 5 mm. Port closure is surgeon-specific.<sup>[5,9]</sup>



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