

Advantages and Indications for Laparoscopic Cholecystectomy: A Review

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ABSTRACT

Laparoscopic cholecystectomy quickly became the procedure of choice for treating patients with biliary discomfort and gallstone problems after the initial reports appeared in the late 1980s. Technical advancements, particularly in miniature video cameras and specialized equipment, played a crucial role in the evolution of laparoscopic cholecystectomy. Subsequent improvements in the design and production of instruments and equipment have further enhanced the safety and efficacy of minimally invasive surgery, extending its application to the treatment of various gastrointestinal illnesses, including gallstone disease.

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INTRODUCTION

Laparoscopic cholecystectomy quickly became the procedure of choice for treating patients with biliary discomfort and gallstone problems after the initial reports appeared in the late 1980s. The advantages of this less intrusive method over an open cholecystectomy are well-established, and they include a speedier return to regular activities and a reduced overall morbidity and death rate. Historically, gynecologists' early attempts at operational laparoscopy and diagnostic laparoscopy led to the development of laparoscopic cholecystectomy. Technical developments in miniature video cameras and other specialized equipment laid the groundwork for the creation of laparoscopic cholecystectomy. Significant advances have been made to the safety and usefulness of minimally invasive surgery in the treatment of most GI illnesses, including gallstone disease, thanks to advancements in the design and production of instruments and equipment^{1, 2}.

TECHNIQUE

During a laparoscopic cholecystectomy, general anesthesia is used. Patients with biliary discomfort or mild gallstone disease are not usually prescribed prophylactic medications. If antibiotics have not been begun prior to surgery, patients with long-term symptoms, those with acute cholecystitis and cholangitis, and those with probable infectious complications

from gallstones should be prescribed antibiotics. Using sequential compression stockings can help lower extremities thromboembolism risk³.

Carbon dioxide, a medically safe and nonflammable gas, is used to induce a pneumoperitoneum, which creates space for equipment and allows views of the contents of the abdomen. Either a direct, open technique—in which the operating trocar is inserted directly into the abdomen under direct visualization through a small incision—or a closed technique—in which a Veress needle is inserted into the peritoneum through a small incision—are used to achieve pneumoperitoneum. A trocar is positioned at the umbilicus and a laparoscope is inserted once the pneumoperitoneum has been created. In order to introduce retractors and operational equipment, three more trocars are positioned in the upper abdomen under clear visibility^{3, 4}.

A one-incision laparoscopic surgery technique, in which the operating surgeon inserts the laparoscope and surgical tools into the belly through a single operating port positioned at the umbilicus, was used by certain surgeons to do laparoscopic cholecystectomy in the 2010s. Better aesthetics are one of this technique's advantages over the conventional 4-port laparoscopic method. Due to lengthier operating times, increased costs, a higher risk of wound complications and hernias, and maybe a higher risk of bile duct damage, single-incision laparoscopic surgery has not been widely accepted⁵.

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IV hydration, tissue perfusion restoration, and electrolyte balance restoration are the first steps in the management of an acute cholecystitis patient. Because more than 40% of patients have positive bile or gallbladder wall cultures for bacteria, IV antibiotics are recommended. For patients who are mildly to moderately unwell, a cephalosporin like cefoxitin is sufficient; but, in more severe instances, broad-spectrum antibiotics like piperacillin-tazobactam or a third-generation cephalosporin combined with metronidazole should be used. An medication that is efficient against anaerobic organisms should be added if gangrenous or emphysematous cholecystitis is suspected. In patients with mild-to-moderate cholecystitis, postoperative antibiotic treatment is not recommended if source control is accomplished by surgery. Antibiotics should be maintained postoperatively for individuals with gangrenous cholecystitis, or an intraoperative rupture of an infected purulent gallbladder ⁶.

The certainty of the diagnosis, the intensity of the attack, and the patient's overall state all influence the course of treatment that follows. Cholecystectomy should be performed right away if the patient has severe cholecystitis and risks of complications like perforation seem likely. In cases when the symptoms are unclear, surgery can be necessary to make a diagnosis. On the other hand, an initial nonoperative strategy can be advantageous for an older adult patient who also has concomitant conditions like heart failure ⁷.

It was once debatable when to do a cholecystectomy on a typical patient who had acute cholecystitis. For acute cholecystitis, several prospective randomized controlled clinical studies have evaluated the timing of early (within three days of presentation) and delayed (after six to eight weeks) surgery. According to a meta-analysis of these studies, early surgery is better for the typical patient since it reduces hospital stays and associated expenditures, morbidity, and fatalities from progressive acute cholecystitis. It doesn't seem that having surgery done early significantly raises the main risks of cholecystectomy, namely bile duct damage ⁸.



Figure 1. Gallbladder in laparoscopy

SPECIAL SITUATIONS

In most situations, laparoscopic cholecystectomy is a reasonable treatment option for acute cholecystitis, despite early worries over its safety. Patients with coagulopathy or significant inflammation that makes it difficult to identify the

components of the hepatocystic triangle may experience technical issues. In some situations, a different strategy to a complete cholecystectomy can be required, such as an open approach or laparoscopic subtotal fenestrating or reconstituting cholecystectomy. When confirming the ductal architecture in individuals with acute cholecystitis, cholangiography is especially helpful. Patients with acute cholecystitis can also benefit from laparoscopic cholecystectomy, which includes less incisional discomfort, a shorter hospital stay, and a quicker return to work ⁹.

Cholecystostomy (drainage of the gallbladder) is a better option than cholecystectomy for high-risk patients who have serious coexisting conditions such hepatic, lung, or cardiac failure. For the majority of patients, a percutaneous method has replaced an operational cholecystostomy. If the patient's general health permits it, a laparoscopic cholecystectomy should be done once the patient has recovered from the acute cholecystitis episode. As an alternative, the patient might be treated expectantly after any leftover stones are removed via the cholecystostomy tube. Of patients treated with a cholecystostomy, around half experience recurrent biliary symptoms ¹⁰.

When compared to people without diabetes, patients with acute cholecystitis have a markedly increased incidence of infectious complications such sepsis. This patient group should get a cholecystectomy as soon as possible ¹¹. Similar to this, acute cholecystitis in the elderly might present clinically as benign at first, but it is linked to a high incidence of concealed severe acute cholecystitis, which can lead to gangrene and empyema. A WBC count of more than 15,000/mm³ in the beginning, diabetes mellitus, cardiovascular illness, and male gender are all linked to gangrenous or emphysematous cholecystitis. In older adult patients, early cholecystectomy is necessary to guarantee timely infection management, same as in individuals with diabetes. It is not recommended and may even be harmful to routinely utilize surgical drainage catheters following laparoscopic cholecystectomy for acute cholecystitis ¹².

CONCLUSION

Laparoscopic cholecystectomy has emerged as the preferred method for treating patients with biliary discomfort and gallstone problems since its introduction in the late 1980s. The procedure offers clear advantages over open cholecystectomy, including a quicker return to regular activities and a lower overall morbidity and death rate. The development of laparoscopic cholecystectomy can be traced back to the early attempts by gynecologists at operational laparoscopy and diagnostic laparoscopy, which eventually paved the way for this minimally invasive approach. Technical advancements, particularly in miniature video cameras and specialized equipment, played a crucial role in the evolution of laparoscopic cholecystectomy. Subsequent improvements in the design and production of instruments and equipment have further enhanced the safety and efficacy

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