

Intraoperative and Postoperative Complications of Three Dimensional (3D) Laparoscopic Cholecystectomy

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ABSTRACT

Aim: To determine the intraoperative and postoperative complications of three dimensional (3D) laparoscopic cholecystectomy.

Methodology: This prospective observational study was carried out General Surgery Department of multiple hospitals of Sindh during the time period of 1st July, 2021 to 30th June 2022. Cholelithiasis were included in the study were included. The baseline and specific assessments in all patients, especially abdominal ultrasound for diagnosis of gallstone disease were done. All prepared were 3D laparoscopic cholecystectomy.

Results: Sixty nine (88.46%) were females and 9(11.53%) were males with mean age was 37.32±4.03 years. Common intraoperative complications were gallbladder rupture observed in 3(3.84%) cases tight adhesions around gallbladder, bleeding from liver bed in 2(2.56%) cases. Post-operatively 4(5.12%) patients had nausea, postoperative fever in 5(6.40%) cases, port-site bleeding in 3(3.84%) cases and port site infection in 4(5.12%) cases.

Conclusion: Intraoperative and postoperative complications are more common in patients with older age and male gender.

Keywords: Intraoperative complications, Postoperative complications, 3D laparoscopic cholecystectomy

INTRODUCTION

Laparoscopic procedures have revolutionized the field of surgery by providing minimally invasive techniques for various surgeries¹. Two-dimensional (2D) laparoscopic procedures have been in use for a long time, but with advancements in technology, three-dimensional (3D) laparoscopy has emerged as a viable alternative². The use of a 3D camera system in laparoscopic procedures provides surgeons with a more realistic and detailed view of the surgical site, enabling them to perform complex surgeries with greater precision and accuracy³. One advantage of 3D laparoscopy is improved depth perception. With a 2D image, it can be difficult for surgeons to accurately judge distances between objects or tissues⁴.

However, with a 3D image, they can better visualize the spatial relationships between different structures and manipulate instruments more precisely⁵. Another advantage is enhanced visualization. The 3D images provide better contrast and definition, making it easier for surgeons to identify anatomical structures and differentiate between tissues. 3D laparoscopic procedures have been shown to improve surgical efficiency⁶. 3D has been associated with eye problems such as headaches, fatigue, and eye strain⁷. Costa et al⁸ also found that 3D laparoscopy was associated with shorter operating times and reduced blood loss compared to 2D laparoscopy.

MATERIALS AND METHODS

This is a prospective observational study conducted in General Surgery Department of multiple hospitals of Sindh were Liaquat

University of Medical & Health Sciences (LUMHS), Jamshoro and Civil Hospital Nawabshah and Suleman Roshan Medical College Tando adam to evaluate the intraoperative and postoperative complications of 3D laparoscopic cholecystectomy. All 78 patients from 1st July 2021 to 30th June 2022 presenting to the surgical OPD with complain of upper abdominal pain or right hypochondrium pain associated with nausea and vomiting and diagnosed cases of cholelithiasis were included in the study, while exclusion criteria included those with co-morbidities or Some other surgical operation planned during LCC, expected major risk of conversion. We performed baseline and specific assessments in all patients, especially abdominal ultrasound for diagnosis of gallstone disease. Statistical analysis was done by version 25 SPSS and all data was expressed using mean and standard deviation.

RESULTS

There were 69(88.46%) females and 9(11.53%) males with female to male ratio of 7.6:1. Age ranged from 20 to 60 years with mean age was 37.32±4.03 years. Common intraoperative complications was Gallbladder rupture observed in 3(3.84%) cases tight adhesions around gallbladder, bleeding from liver bed in 2(2.56%) cases (Fig. 1, Table 1) Post-operatively 4(5.12%) patients had nausea, postoperative fever in 5(6.40%) cases, port site bleeding in 3(3.84%) cases and port site infection in 4(5.12%) cases (Fig. 2).

Table 1: Complications according to age and gender

Variable	Complications					
	Intraoperative (N=5)		Postoperative (N=16)			
	Gallbladder rupture	Bleeding from liver bed	Nausea	Postoperative fever	Portside bleeding	Portside infection
Age in years						
20 to 40	2(2.56%)	-	2(2.56%)	1(1.28%)	1(1.28%)	1(1.28%)
41 to 60	1(1.28%)	2(2.56%)	2(2.56%)	4(5.12%)	2(2.56%)	3(3.84%)
P value	<0.001					
Gender						
Male	2(2.56%)	2(2.56%)	1(1.28%)	1(1.28%)	-	1(1.28%)
Female	1(1.28%)	-	3(3.84%)	4(5.12%)	3(3.84%)	3(3.84%)
P value	0.003					

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Fig. 1: Intraoperative complications

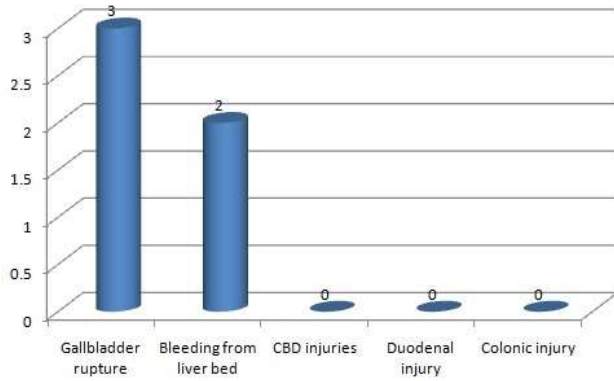
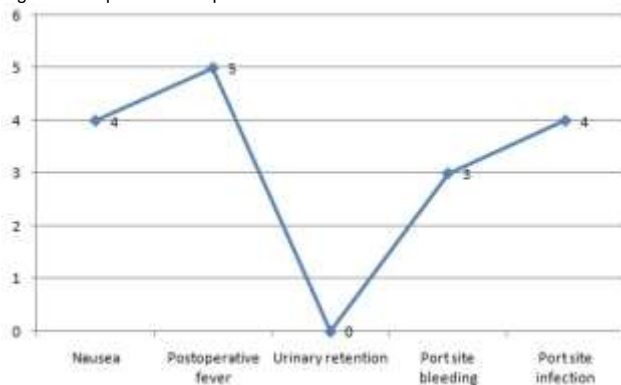


Fig. 2: Postoperative complications



DISCUSSION

The traditional method of cholecystectomy involves a large incision in the abdomen, which results in longer recovery times and more pain. However, with the advancement in technology, 3D laparoscopic cholecystectomy has become a popular alternative. This minimally invasive surgery offers numerous benefits over the conventional approach. We have observed minor intraoperative and postoperative complications⁹.

The most common cause of gallbladder rupture during 3D laparoscopy is excessive traction or manipulation of the gallbladder, leading to perforation or tear. This can result in bile leakage, infection, bleeding, and damage to other organs. In severe cases, emergency surgery may be required to control the complications.¹⁰ In the present study, 3 (3.84%) cases observed gallbladder rupture due adhesions around gallbladder. However the study of Davies et al¹¹ also reported significantly lower risk of gallbladder perforation during surgery. During a 3D laparoscopic cholecystectomy, the surgeon must carefully dissect and remove the gallbladder while avoiding damage to surrounding organs, such as the liver. However, bleeding from the liver bed can occur if there is accidental injury to blood vessels or bile ducts during this process. This can lead to significant blood loss and potentially life-threatening complications. A study of Shaikh et al¹² reported liver bed bleed during 3D procedure found in 4(5.47%) cases. While compare with this study 2(2.56%) cases bleeding from liver bed and no one case observed common bile duct injury during performed the 3D laparoscopic procedure.

Some minor postoperative complications are observed after laparoscopic cholecystectomy, but nausea is one of the most frequent and distressing symptoms. The cause of nausea in this procedure is not fully understood, but it is believed to be related to the use of carbon dioxide gas to inflate the abdomen during surgery, which can irritate the diaphragm and cause nausea and other factors such as anesthesia and pain medications. National study reported postoperative nausea 1.36%¹², while this study

reobserved 5.12% postoperative nausea. Fever is a commonly occurrence after surgery, and it can be caused by various factors. Surgical procedures can cause inflammation in the body, which may lead to a fever. Additionally, anesthesia can affect the body's temperature regulation, leading to an increase in body temperature. Infections are also a significant cause of postoperative fever^{13,14}. In this study postoperative fever was observed in 5(6.40%) cases.

Port-site bleeding is a complication that occurs after laparoscopic surgery. It refers to the bleeding that occurs at the site where the surgical instruments were inserted into the abdomen. The bleeding can range from mild to severe, and various factors can cause it such as trauma to blood vessels during surgery, use of anticoagulant medications. Our results are comparable with the study of Radunovic and colleagues¹⁵ with port side bleeding in 3(3.84%) cases when they analyzed the medical records of 740 patients who underwent laparoscopic cholecystectomy, of whom (13.1%) Complications occurred during the procedure. Bleeding (3.64%) was the most common, and (0.94%) surgical wound infection. Another international study also reported that laparoscopic cholecystectomy was associated with port-site complications with a rate of up to (10.5%), the highest rate of bleeding cases (4%), followed by wound infection (2.5%), and then hematoma¹⁶ in current study, port-site infection in 4(5.12%) cases.

CONCLUSION

3D laparoscopic procedures have their advantages. 3D laparoscopy provides better depth perception, improved ergonomics, and improved surgical efficiency. Intraoperative and postoperative complications are more common in patients with older age and male gender.

Conflict of interest: Nil

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