

Original Research Article

An analysis of postoperative adverse events following laparoscopic cholecystectomy in a tertiary care hospital

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ABSTRACT

Background: Being one of the most commonly performed surgery in the modern era, post-operative complications following laparoscopic cholecystectomy deserve special mention. Though not very life threatening, they are quite common. Considering these aspects, this study aims to identify them and possibly a potential remedy for decreasing the incidence in the future.

Methods: This is a retrospective, institution-based, observational and cross-sectional analysis conducted in R.G. KAR Medical College and Hospital over 5 years on 1000 patients undergoing surgery. Here we intend to observe the adverse events following laparoscopic cholecystectomy in the post-operative period.

Results: Most of the complications were seen in the age group greater than 40 years (63%) followed by the age group 30-40 years (26%). Adverse events were much more common in females (85%) followed by males (15%). The symptoms appeared mostly during 3-7 days post operatively (57%) followed by 20% within the first 6 hours. Non-specific abdominal pain (28%) was the most common adverse event followed by port-site infection in 16.5% cases.

Conclusions: Proper pre-anaesthetic check-up with proper instrument handling with proper caution and before closing confirmation of proper placement of clip and no other unintentional injury anywhere can decrease the post-operative complication.

Keywords: Abdominal pain, Adverse event, Laparoscopic cholecystectomy, Port-side infection, Pre-anaesthetic check-up

INTRODUCTION

Laparoscopic cholecystectomy has now been considered the gold standard for the treatment of gallstone disease. It took more than 100 years for a new technique of this magnitude to replace the classical open cholecystectomy, but once introduced it the last 20 years is going to be remembered as a revolution in the field of surgery. On March 17, 1987, Philippe Mouret performed the first laparoscopic cholecystectomy, in Lyon, France.¹ This date represents a profound epistemological leap.” Before

that, there was nothing, after that there was laparoscopic surgery.² It is preferred over open cholecystectomy for a number of reasons e.g. fewer operative complication, improved cosmetics, less duration of hospital stay and overall, since it bears less cost.³ However, as thorn in the rose, laparoscopy is not without complications.⁴ Bleeding and bile duct injury during laparoscopy can occur due to failure of visualization and identification of anatomy of gall-bladder bed or due to lack of experience according to Schol et al.⁵ Huang et al also reported comparable data showing complications are more frequent during first 10-

15 cases of laparoscopic cholecystectomy.⁶ This is also supported by the study by Duca et al.⁵ Postoperative complications can be early and late complications. Early complications according to Clavien's classification are port site infections (Grade I); bile leak and haemorrhage (Grade IIA); Choleperitoneum, subhepatic abscess and retained stones (Grade IIB).⁶ Late complications could be presence of residual calculi and umbilical site incisional hernia.⁵ All these complications are added with the anaesthetic complications. Importance of post-operative complication is immense and the occurrence and severity depends on the expertise of the surgeon primarily followed by proper anaesthetic check-up and instrumentation. Adverse event, as a whole, means any untoward medical occurrence in the participant, which does not necessarily have a causal relationship with the intervention.⁷ Bile duct injuries were seen post-operatively and most frequently required anastomotic repair. Post-operative bile leak most commonly originated from the cystic duct.⁸ The greatest risk factor for this was inexperience. The complications were more common in patients having history of previous upper abdominal surgery. Any untoward symptoms in the postoperative period such as fevers, chills or abdominal pain require immediate investigation. Factors increasing the risk for post-operative mortality include advanced age, comorbid conditions and acute presentation.⁹ Thus it is essential to inform the patient adequately and for the surgeon to take necessary precaution.

METHODS

A retrospective, observational cross-sectional analysis. Conducted at department of surgery, R G KAR Medical College and Hospital. between January 2014-January 2019. A total 1000 patients undergoing Laparoscopic Cholecystectomy selected randomly out of all patients in the department of surgery, R G KAR Medical College and Hospital.

Inclusion criteria

Case patients undergoing laparoscopic cholecystectomy.

Exclusion criteria

- Patients undergoing open cholecystectomy
- Patients who needed conversion to open cholecystectomy.

Study tools

- History
- Clinical examination.
- Investigation for identifying complications.

Study parameter

- Demography of the patients who had post-operative complications

- Interval after which post-operative complications were noted
- Details of post-operative complications.

Study technique

This is a retrospective, observational analysis. Patients undergoing laparoscopic cholecystectomy were reviewed for complications and necessary investigations were undertaken to confirm the data obtained or inserted in a MS-Excel spreadsheet following which statistical analysis was done.

Statistical analysis

Inserting data in a MS-Excel spreadsheet after which percentages were calculated.

RESULTS

Age distribution of patient having post-operative complication

Gall stone disease is a disease occurring most commonly in patients of the age group >30-40 years. Also, it is known that increasing age is usually associated with poor prognosis and more incidents and severity of complication. Table 1 shows the distribution of patients according to their age and their respective chances of getting a complication.

Table 1: Table showing number and percentage of post-operative adverse events.

S. no.	Adverse events	Number	Percentage (%)
1	Non-specific abdominal pain	41	28
2	Port site infection	24	16.5
3	Bleeding	23	15.35
4	Liver injury	16	11
5	Prolonged ileus	14	10
6	Retained stone	7	5
7	Cholangitis	6	4
8	Pancreatitis	4	2.8
9	Bile duct injury	3	2
10	Vessel injury	3	2
11	Anaesthetic event	3	2
12	Bowel injury	1	0.7
13	Bladder injury	1	0.7
Total		146	100

Sex distribution of patient having post-operative complication

It is a well-known fact that gall stone disease is much more common in fat, fertile females and hence the

proportion of complications was also found to be more in them.

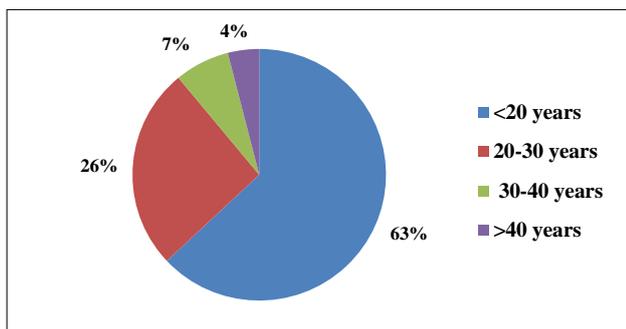


Figure 1: Age distribution of patients having postoperative complication.

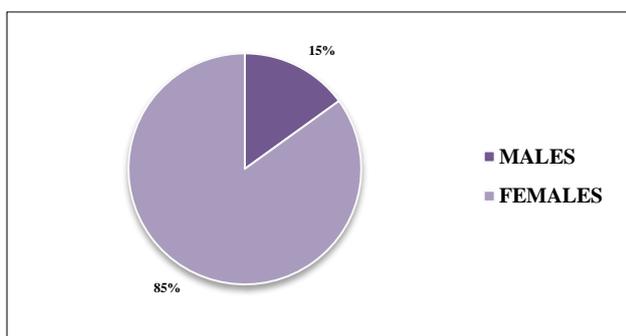


Figure 2: Sex distribution of patients having postoperative complication.

Interval of appearance of symptoms in the post-operative period

Majority of the symptoms occurred either within the first 6 hours after operation or within 3-7 days of the operation. Hence it is essential for the surgeon to be alert in diagnosing any complication during this time period so that necessary interventions can be taken as early as possible.

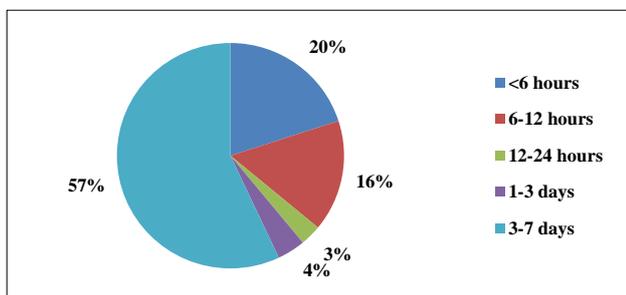


Figure 3: Duration after which postoperative complications occur.

Complications which occur post operatively

It is the most essential thing which determines the future prognosis of the patient. Here we found abdominal pain,

port site infection, bleeding, liver injury and prolonged ileus to be the most frequently encountered.

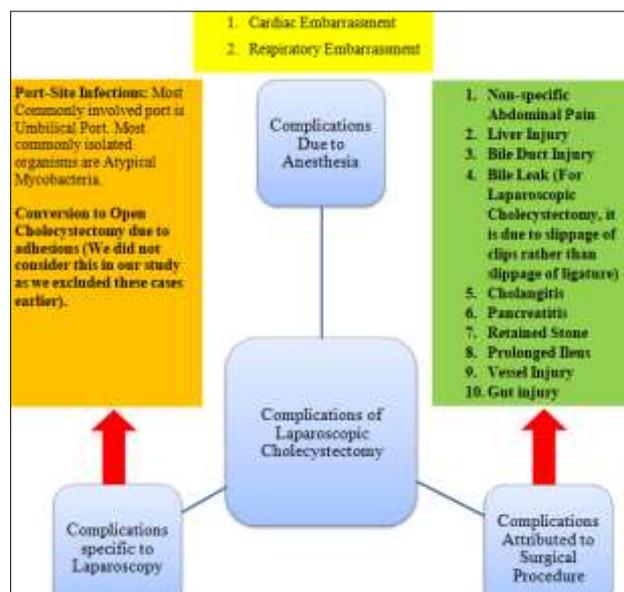


Figure 4: Classifications for complications following laparoscopic cholecystectomy.

DISCUSSION

Serious complication of laparoscopic cholecystectomy falls into two major areas

Access complication and bile duct injury. The latter results from poor dissection and failure to define the surgical anatomy adequately. Patients who develop jaundice in the post-operative period require urgent investigation, especially if associated with cholangitis. The first step in management following resuscitation and administration of antibiotics is to undertake an urgent ultrasound scan to demonstrate intra or extra hepatic ductal dilatation. A further ERCP or MRCP may be needed for confirmation. Small biliary leaks usually resolve spontaneously but if the common bile duct is damaged it requires urgent reconstruction.

About 15% of bile duct injuries are recognized intra-operatively and 85% post operatively. Any post-operative elevation in serum bilirubin or duct damage require investigation. HIDA scan maybe helpful to confirm and quantitate the bile leak.

The surgical repair and subsequent outcome are related to the level and degree of injury in conjunction with the presence or absence of vascular injury. Strasberg Classification has been commonly utilised for this purpose.

In up to 15% of patients cholecystectomy fails to relieve the symptoms for which the operation was performed. They are usually an extension of the pre-operative symptoms. These patients are considered to have a ‘post-

cholecystectomy' syndrome. Thorough investigation of a stone in the bile duct or cystic duct stump must be diagnosed by MRCP or ERCP, the latter having the advantage of therapeutic removal with it.⁹

CBD injury in future can present with benign stricture and obstructive jaundice, later requiring endoscopic stenting, or even an entire hepaticojejunostomy or choledochojejunostomy.¹⁰ Thus considering the fact that 80% of the benign biliary stricture occur due to Laparoscopic interventions during gall bladder surgery, post-operative evaluation of this is necessary on part of the surgeon.

Figure 1 showed that most of the complication occurred in the age group >40 years followed by the age group of 30-40 years. Figure 2 showed a marked difference in the sex distribution of post-operative complication, with the females being involved in 85% of the cases and remaining being males. Figure 3 demonstrated the appearance of symptoms mostly after the 3rd days and earlier than 7th day of post-operative period (57%), followed by immediately within 6 hours of operation (20%).

Port site infection has emerged to be one of the most bothersome complications which undermine the benefit of minimal invasive surgery. Despite the advances in the field of anti-microbial agents, sterilisation techniques, surgical techniques, it still prevails. Emergence of rapidly growing atypical mycobacteria with multi drug resistance has further compounded the problem. Port site infections are preventable if appropriate measures are taken pre-operatively, intraoperatively and post operatively. Macrolides, quinolones and aminoglycosides show promising activity against them.¹¹ Post-operative abdominal pain was noticed as the most common complication post operatively. It was characterized as overall pain, shoulder pain, incisional pain and visceral pain. It showed marked inter individual variability. Its intensity quickly decreases after the first 24 hours post operatively. Intraperitoneal bupivacaine is ineffective in treating this type of pain.¹² According to research obtained by Narchi et al. It was also seen that laparoscopic cholecystectomy was associated with better outcome of pulmonary function test than open cholecystectomy.¹³

Liver injury of intra or extra-hepatic bile ductules along with leakage of bile along duct of luschka may be commonly encountered in the post-operative stage. Bleeding at a later stage may occur due to slipping of a ligature or a clip placed on a major vessel which can result in local haematoma followed by superimposed infection. Early identification and management of this is necessary to avoid a serious sequelae. Iatrogenic pancreatitis though rare, is a serious complication which may occur following instrumental manipulation. Retained stone within the gall bladder or CBD can result in cholangitis presenting with Charcot's triad. Use of

opioids for post-operative pain management can result in prolonged ileus which should be conservatively managed. Isolated iatrogenic small bowel injury is a rare but dreaded complication which can be prevented by meticulous handling of closing technique of fascial layer and maintenance of relaxation throughout the operation.¹⁴ Diaphragmatic injury following laparoscopic cholecystectomy is an extremely rare complication which might present with symptoms of acute respiratory distress syndrome along with small bowel incarceration and peritonitis.¹⁵ Surgical clips causing delayed abscess formation are very unusual but has been reported in some cases.¹⁶

Cardiovascular and respiratory events related to anaesthesia have been noticed in a few cases. Finally, we here like to classify the complications of laparoscopic cholecystectomy as following.

CONCLUSION

In our study we found several adverse effects in the post-operative case of laparoscopic cholecystectomy. Most common was pain abdomen (28%); port site infection was second most with 16.5%. There was one case each of gut perforation, bladder injury and there are 3 cases of peritonitis. The instrument quality in laparoscopic cholecystectomy is important as there is slippage of clip from cystic artery (16.6%) and from duct (10%) due to poor quality technique and instrument. For this chance of bile duct leakage and bleeding increases.

Hence from our study we infer proper anaesthetic check-up with proper instrument handling with proper caution and before closing confirmation of proper placement of clip and no other unintentional injury anywhere, can decrease this postoperative complication.

Proper informed consent to the patient and expert vigilance of the doctor form an important mode of prevention of such complication.

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