International Surgery Journal
Aashu A et al. Int Surg J. 2016 Nov;3(4):2104-2108
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20163582

Original Research Article

A prospective study of different complications following laparoscopic cholecystectomy in a tertiary care hospital in Eastern India

Anshuman Aashu[1]*, Prosanta K. Bhattacharjee[1], Shyamal K. Halder[2], Nidhi[3]

[1]Department of General Surgery, IPGME and R, Kolkata, India
[2]Department of General Surgery, Malda Medical College, Malda, India
[3]Department of Obstetrics and Gynaecology, Patna Medical College, Patna, India

Received: 16 July 2016
Revised: 17 July 2016
Accepted: 23 August 2016

***Correspondence:**
Dr. Anshuman Aashu,
E-mail: anshuman.aashu@gmail.com

ABSTRACT

Background: Laparoscopic approach for cholecystectomy has already become the standard of care for the management of symptomatic and (in selected cases) asymptomatic cholelithiasis. Despite proven advantages laparoscopic cholecystectomy (LC) is known to be associated with certain complications.
Methods: This prospective study was undertaken to document the incidences of such complications and to compare them to those in already published data. A total of 750 cases of LC performed in the department of general surgery at IPGME and R and SSKM hospital, Kolkata were observed for a minimum period of 8 weeks following surgery. The complications were noted and their incidences calculated using simple statistical tools. These were then compared with those in already published data.
Results: A total of 493 complications occurred in 483 patients (64.4%). The most common complication was port-site infection (PSI) occurring in 476 patients (63.5%). The other complications included bleeding (1.2%), bowel injury (0.7%) and bile duct injury (0.4%). Mortality occurred in 3 cases (0.4%). Conversions to open cholecystectomy (OC) due to inability to proceed in a timely manner because of difficult exposure or unclear anatomy were not considered as complications rather as an inevitable extension of the primary approach in some difficult scenarios.
Conclusions: At the end of our study period we could conclude that the incidences of specific complications in our study are less than those reported from different centres across the globe except for PSI. The alarmingly high incidence of PSI noted is a matter for introspection. A detailed study needs to be undertaken so that appropriate measures may be taken to prevent this scourge.

Keywords: Laparoscopic cholecystectomy, Complications, Bile duct injury, Port site infections

INTRODUCTION

Laparoscopy cholecystectomy (LC) has already become the standard of care in the management of symptomatic and (in selected cases) asymptomatic cholelithiasis.[1,2] The proven advantages of laparoscopic approach over open approach includes less post-operative pain, decreased hospital stay, earlier recovery, better cosmesis and cost-effectiveness amongst others.[3] With the increasing use of LC, the spectrum of associated complications is also changing. With the increasing experience of the operating surgeon, the severe complications like bile leak, bowel injury and vascular injury are expected to decrease.[4]

This prospective observational study analyses the incidences of complications of LC in a tertiary care centre in eastern India and compares them to those in already published data.

METHODS

The study was carried out in the department of general surgery, Institute of Post-Graduate Medical Education and Research, Kolkata. All the patients undergoing laparoscopic cholecystectomy in the different units of the department during the period of February 2013 to August 2014 were observed for complications in the intra-operative and post-operative period. The patients were followed-up for a minimum period of 8 weeks after the surgery. Those patients who could not be followed-up for at least 8 weeks were excluded from the study.

The complications were first classified as access related, associated with pneumoperitoneum and specific operative complications. Further they were classified according to the time they were first noticed. Those occurring during the procedure were classed as intraoperative and those occurring after the procedure as postoperative that included early (within 7 days of surgery) and late (after 7 days of surgery).

Conversions to the open procedure that resulted due to inability to proceed further in a timely manner due to difficult operative field or unclear anatomy were not considered a complication rather an extension of the primary approach itself in difficult scenarios. Such patients were excluded from the study.

RESULTS

A total of 772 cases of LC were performed over the study period (19 months). 14 cases were converted to open surgery due to various reasons while 8 cases were lost to follow-up. Out of the 750 cases studied, majority (33.6%) were in the age group 41-50 years. 32% cases were in the age group 51-60 years and 29.6% in 31-40 years. 3.2% and 1.6% of the total cases were aged <31 years and >60 years respectively. Females constituted 68.9% of the total study population as shown in Table 1.

Table 1: Age and sex distribution.

Age	Male	Female	Total	Percentage
<31	6	18	24	3.2
31-40	90	132	222	29.6
41-50	133	119	252	33.6
51-60	54	186	240	32
>60	3	9	12	1.6
Total	**286**	**464**	**750**	–

A total of 483 patients (64.4%) were noted to have some complication. Some of the patients experienced more than one complication; hence, total number of complications that occurred in these 483 patients was 493. Port-site infection (PSI) (Figure 1) presented as the most common complication with an incidence of 63.5% as shown in Table 2.

Table 3 shows the incidence of different complications that occurred during our study and also compares it to the data already available from other studies.[7-10] In our series, bleeding during the procedure occurred at an incidence of 1.2% and all of these cases included bleeding at the time of access itself. Bowel injury was noted in a total of 0.7% of cases (5 cases). 3 of these cases (0.4%) had bowel injury at the time of port placement and were identified at the time of procedure itself and were managed laparoscopically. 2 cases (0.3%) were noted to have bowel injury during the dissection of the callot's triangle and included 1 case each of duodenal and transverse colon injury. The injuries were identified post-operatively with development of peritonitis and were managed by laparotomy.

Table 2: Complications of laparoscopic cholecystectomy.

Timing	Specific Incidence	Total	(%)
Intra-operative		13	2.6
Bleeding	9		
Bowel injury	3		
Biliary injury	1		
Early post-operative (<7 days)		3	0.6
Bowel injury	2		
Biliary injury	1		
Late post-operative		477	96.8
Biliary injury	1		
Port-site infection	476		

Biliary injury and consequent bile-leak was noted in 3 cases (0.4%). 2 of these cases were identified in the post-operative period with development of biliary peritonitis and were managed accordingly while the rest 1 case was identified intra-operatively which was managed laparoscopically.

Mortality occurred in 3 cases (0.3%). 1 of these cases was an elderly female with history of ischemic heart disease who succumbed to an attack of acute myocardial infarction (MI) on the same evening of an uneventful surgery. The other 2 cases were secondary to some operative complications, 1 being a consequence of bile-duct injury and the other a consequence of duodenal injury.

As far as the timing of complications is concerned, majority (96.8%) occurred in the late post-operative period. 2.6% of all complications were noted in the intra-operative period and rest 0.6% were identified in the early post-operative period as shown in Table 3.

DISCUSSION

Laparoscopic cholecystectomy has already been established as the gold standard in the management of

symptomatic as well as asymptomatic (selected) cases of cholelithiasis. There has been a steady increase in the number of procedure being performed all over the world. With the increasing experience of surgeons, the spectrum of complications associated with this approach is rapidly changing. Still, the complications of LC are significant in the teaching facilities owing to the steep learning curve. This study aimed at observing the incidence of various complications of LC in a tertiary care center of eastern India that also serves as a teaching institution. The incidence of these complications was then compared with those in already published data worldwide.

Table 3: Incidence of complications in different studies.

Complications	Muqim et al (n = 351)	Duca et al (n = 9542)	Ghani et al (n = 105)	Shamiyeh et al (review article)	Index study (n = 750)
Bleeding	37.27%	2.3%	6.66%	3.2-27.6%	1.2%
Biliary injury	5.4%	0.1%	3.8%	0.2-0.8%	0.4%
Bowel injury	-	-	0.95%	0.07-0.7%	0.7%
Wound infection	4.84%	-	4.76%	-	63.5%
Biliary stricture	1.42%	-	-	-	0.4%
port site hernia	0.85%	-	-	-	-
Death	0.56%	0.1%	1%	-	0.4%

In our study, a total of 750 cases of LC were observed for complications. Majority (33.6%) patients were aged 41-50 years. 68.9% of all the cases were female owing to the higher incidence of gall-stone diseases in this sex group.[5] For all the patients, the classical 4-port LC was performed, however, the method of obtaining access depended on the surgeon's preferences.

Biliary injury is a serious complication of LC that may lead to prolonged morbidity as well as mortality in some cases. Various studies have reported biliary injury to occur at an incidence of 0.5-1.4%.[6] However, there are reports of these complications occurring at a higher incidence as much as 3.8% by Ghani et al and 5.4% by Muqim et al.[7,8] In our series bile duct injury occurred with an incidence of only 0.4% (3 cases). In 1 of these cases, the injury was a lateral tear of the bile duct which was identified intraoperatively and was managed laparoscopically at the time of the index procedure itself. The other 2 cases were identified post-operatively (1 each in early and late post-operative period). One of these patients died of the consequences of the injury while the other required a hepaticojejunostomy for the post-operative biliary stricture.

Bleeding during the procedure has been reported to be the most common complications in various studies ranging in incidence from 2%-27%.[7-10] In our series, major vascular injury was not seen at all. More than usual bleeding occurred at the time of port placement in 9 cases (1.2%). In all the cases, no extra intervention was required to control the bleeding and it stopped by applying pressure only in all the cases.

Bowel injury is another serious complication of LC. Various studies have reported bowel injury occurring during LC at an incidence of 0.07 - 0.9%.[7,10] Bowel injury occurred at an incidence of 0.7% (5 cases) in our study. 3 of these cases occurred at the time of port-placement and

All of them were identified intra-operatively and managed accordingly during the same procedure without any post-operative consequences. Rest 2 cases included 1 case each of duodenal and transverse colon injury that occurred during the dissection. Both the injuries were identified post-operatively with development of peritonitis. The patients were managed with subsequent laparotomy. The patient with duodenal injury expired due to sepsis on the 7th post-operative day of the index procedure. The patient with colonic injury recovered well with a transverse colostomy which was subsequently closed 6 weeks after the index procedure.

The incidence of port-site infection (PSI) following LC has been reported to be less than that in open surgery as shown in Figure 1.[11] Most of these PSIs involve only the skin and subcutaneous tissue.[12-14] They may present as peri-incisional erythema, wound discharge, malaise and later ulceration.[15] In various reports the rate of incidence varies and amounts to around 4%.[7,8,12,16-18] However, PSI emerged as the most common complication in our study at an incidence of 63.5%. All of these cases were identified in the late post-operative period with maximum cases noted in between 3-4 weeks post-surgery. All of these cases were superficial infections involving only the skin and subcutaneous tissues as suggested by different studies. The exact etiology of the condition couldn't be identified but it might be related to the repeated use of the older instruments with significant wear and tear. A breach in the sterility protocol being used at the institution for laparoscopic instruments might be another reason. The use of 2% glutaraldehyde solution for 20 minutes for disinfection of the instruments along with the

use of boiled tap water for cleansing the instrument prior to the use are other plausible reasons.[19] An extensive study should be undertaken to identify the exact etiology of the condition so that appropriate measures be taken immediately to prevent further occurrence of PSI at such an alarmingly high rate.

Mortality occurred in our study in 3 cases. 1 of these cases was an elderly female with known history of ischemic heart disease who succumbed to an acute attack of MI on the same evening of an uneventful LC. The other 2 cases were secondary to surgical complications as detailed above.

Figure 1: Port site infection.

CONCLUSION

LC is one of the most common procedures being performed laparoscopically. It is a safe approach to the management of cholelithiasis. Life threatening complications occur minimally following LC. The incidence of complications other than PSI is either similar to or lower than that in already published data worldwide. However, the alarmingly high rate of PSI at our center has led to a high incidence of morbidity which is a concern for the surgeon and the hospital authority alike. The cause into the recent surge in this incidence should be sought for immediately and remedial measures be taken so as to improve the patient care as a whole.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Ros A, Carlsson P. Rahmqvist M, Bachman K, Nilsson E. Nonrandomized patients in a cholecystectomy trial: characteristics, procedure, and outcomes. BMC Surge. 2006;6:17.
2. Ji W, Li LT, Li JS. Role of Laparoscopic subtotal cholecystectomy in the treatment of complicated cholecystitis. Hepatobiliary Pancreat Dis Int. 2006;5(4):584-9.
3. Karthik S, Augustine A, Shibumon M, Pai M. Analysis of laparoscopic port site complications: A descriptive study. J Min Access Surg. 2013;9(2):59.
4. Hobbs MS, Mai Q, Knuiman MW, Fletcher DR, Ridout SC. Surgeon experience and trends in intraoperative complications in laparoscopic cholecystectomy. Br J Surg. 2006;93:844-53.
5. Stinton LM, Shaffer EA. Epidemiology of Gallbladder Disease: Cholelithiasis and Cancer. Gut and Liver. 2012;6(2):172-87.
6. Frilling A, Li J, Weber F, Fruhaus NR, Engel J, Beckebaum S, et al. Major bile duct injuries after laparoscopic cholecystectomy: a comparative study. Acta Chir belg. 2006;106(5):1-5.
7. Ghani UF, Khan F, Zaid AY, Afridi KD. Laparoscopic surgery;Incidence of intra operative and early postoperative complications. Professional Med J. 2014;21(3):529-34.
8. Muqim R, Jan Q, Zarin M, Aurangzaib M, Wazir A. Complications of Laparoscopic Cholecystectomy. WJLS. 2008;1(1):1-5.
9. Duca S, Bala O, Al-Hajjar N, Iancu C, Puia I, Munteanu D, et al. Laparoscopic cholecystectomy: incidents and complications. A retrospective analysis of 9542 consecutive laparoscopic operations. Hub. 2003;5:152-8.
10. Shamiyeh A, Wayand W. Laparoscopic cholecystectomy: early and late complications and their treatment. Langenbeck's Arch Surg. 2004;11:23-6.
11. Targarona EM, Balague C, Knook MM, Trias M, authors. Laparoscopic surgery and surgical infection. Br J Surg. 2000;87:536-44.
12. Karthik S, Augustine AJ, Shibumon MM, Pai MV. Analysis of laparoscopic port site complications: A descriptive study. J Minim Access Surg. 2013;9:59-64.
13. Hamzaoglu I, Baca B, Böler DE, Polat E, Ozer Y. Is umbilical flora responsible for wound infection after laparo-scopic surgery? Surg Laparosc Endosc Percutan Tech. 2004;14:263-7.
14. Weiss HG, Brunner W, Biebl MO, Schirnhofer J, Pimpl K, Mittermair C, et al. Wound complications in 1145 con-secutive transumbilical single-incision laparoscopic procedures. Ann Surg. 2014;259:89-95.
15. Losanoff JE, Richman BW, Jones JW. Trocar-site hernia complicated by necrotizing fasciitis-case report and review of the literature. Hernia. 2003;7:220-3.
16. Adisa AO, Alatise OI, Arowolo OA, Lawal OO. Wound Complications Following Laparoscopic Surgery In A Nigerian Hospital. Niger J Surg. 2014;20(2):92-5.
17. Colizza S, Rossi S, Picardi B, Carnuccio P, Pollicita S, Rodio F, et al. Surgical infections after

laparoscopic chole-cystectomy: Ceftriaxone vs ceftazidime antibiotic prophylaxis. A prospective study. Chir Ital. 2004;56:397-402.
18. Yanni F, Mekhail P, Morris-Stiff G. A selective antibiotic prophylaxis policy for laparoscopic cholecystectomy is effective in minimising infective complications. Ann R Coll Surg Engl. 2013;95:345-8.
19. Sharma AK, Sharma R, Sharma S. Port Site Infection In Laparoscopic Surgeries. Ind Med Gaz. 2013;147(6):224-9.

Cite this article as: Aashu A, Bhattacharjee PK, Halder SK, Nidhi. A prospective study of different complications following laparoscopic cholecystectomy in a tertiary care hospital in Eastern India. Int Surg J 2016;3:2104-8.