



COMPARATIVE STUDY OF PRESENCE OF SHOULDER PAIN DURING POST OPERATIVE PERIOD IN OPEN CHOLECYSTECTOMY VS LAPAROSCOPIC CHOLECYSTECTOMY.

General Surgery

Dr. Susruth Maralihalli

Professor, Department of General Surgery, JJM Medical College, Davangere.

Dr. Sishira Potluru Post Graduate, Department of General Surgery, JJM Medical College, Davangere.

ABSTRACT

Background- Gall bladder disease is one of the most common procedures done all over the world. Laparoscopic cholecystectomy has now emerged as the standard of care worldwide compared to the open cholecystectomy. **Objectives-** To compare the presence of right shoulder pain during post-operative period in open cholecystectomy vs laparoscopic cholecystectomy. **Methods:** A retrospective comparative study conducted in patients admitted in Bapuji Hospital and Chigateri District Hospital, attached to JJM Medical College, Davangere, who underwent Open cholecystectomy and Laparoscopic cholecystectomy. Patients were retrospectively evaluated in terms of post-operative shoulder pain, with respect to the surgical procedure, operative time and the presence of abdominal drain in-situ. Data from January 2022 to December 2022 was evaluated. 50 patients who underwent Cholecystectomy were included in the study, and divided into two groups. Group A (25 patients) included patients undergoing open cholecystectomy and Group B (25 patients) included patients undergoing laparoscopic cholecystectomy. SPSS (Version 22.0) was used for analysis. **Results:** The most common age group operated for Cholecystectomy was found to be 40-60 years (49%) followed by 20-40 years (47%) but it was not significant ($p>0.05$). Association between shoulder pain and operative time was compared; it was noted that shoulder pain was higher in patients undergoing laparoscopic cholecystectomy with operative time between 31-90 minutes and results were statistically significant. Hence, longer the procedure time, higher are the chances of shoulder pain. **Conclusion:** In our study it was seen that the operative time was less in laparoscopic cholecystectomy but it was not statistically significant. It was noted that post-operative shoulder pain was higher in laparoscopic cholecystectomy group.

KEYWORDS

Open Cholecystectomy, Laparoscopic Cholecystectomy, Shoulder pain, Operative time, insitu drain

INTRODUCTION

Gall bladder disease is one of the most common procedures done all over the world. Laparoscopic cholecystectomy has now emerged as the standard of care worldwide compared to the open cholecystectomy.^{1,2}

Although laparoscopic cholecystectomy has emerged as the gold standard in gallbladder surgery with its advantages, including less postoperative pain and earlier ambulation with return of normal activities, it is not without its undesirable side effects, of which shoulder tip pain is a troublesome symptom.^{3,4} Reasons proposed as causes of shoulder pain is stimulation of the sympathetic nervous system by hypercarbia⁵, the residual pneumoperitoneum after the surgery, and rapid distention of the abdomen by carbon dioxide⁴

The aim of the present study is to compare the presence of the shoulder tip pain during the post-operative period after open and laparoscopic cholecystectomy. The results were also compared to the operative time and the presence of abdominal drain insitu.

MATERIALS AND METHODS

It was a retrospective comparative study conducted in patients admitted in Bapuji Hospital and Chigateri District Hospital, attached to JJM Medical College, Davangere, who underwent **Open cholecystectomy and laparoscopic cholecystectomy**. Patients were retrospectively evaluated in terms of post-operative shoulder pain with respect to surgical procedure, operative time and the presence of abdominal drain insitu. Data from January 2022 to December 2022 were evaluated.

Sample size

50 patients who underwent Cholecystectomy were included in the study, and divided into two groups. Group A (25 patients) included patients undergoing open cholecystectomy and Group B (25 patients) included patients undergoing laparoscopic cholecystectomy.

Patients undergoing elective cholecystectomy were given verbal and written information concerning the operation, the expected hospital stay, and the complications of surgery.

Inclusion Criteria:

Patients undergoing elective cholecystectomy for Cholelithiasis.

Exclusion Criteria:

I. Emergency cholecystectomy.

- ii. Surgical site infection and Bile leak in the post-operative period
- iii. Chronic pain syndromes such as fibromyalgia or neck and shoulder pain.
- iv. History of long term use of daily opioids.
- v. Unstable cardiovascular disease and hypertension, endocrine system diseases, liver and kidney dysfunction.

Methodology Of Surgical Technique

All patients received similar general anaesthesia and surgical regimens. No pre medication was used. In open cholecystectomy, a Right subcostal incision of approximately 7 to 10 cms in length, 2-3 cms below the Right Costal margin was made. As a routine, the muscle was cut using an electro-cautery after cutting the anterior rectus sheath. The posterior rectus sheath was cut transversely. Laparoscopic cholecystectomy was done by the four port method. Laparoscopy was carried out with abdominal insufflation of CO₂ at 13-15 mm of Hg. The gall bladder was visualized and cholecystectomy was carried out either by the conventional method or the fundus first method depending on the intra-operative findings.

Abdominal drain was placed if intra-operative liver bed ooze was present. Early mobilisation was encouraged. Paracetamol was recommended as routine pain medication for five days, if necessary supplemented by diclofenac and/or tramadol.

Statistical Analysis-

Data so obtained were subjected to statistical analysis. Data analysis was done by SPSS software ® version 22.0. Descriptive statistical analysis, which included frequency and percentages, was used to characterize the data. Chi-square test was used for association between factors and $p<0.05$ was considered statistically significant.

RESULTS:

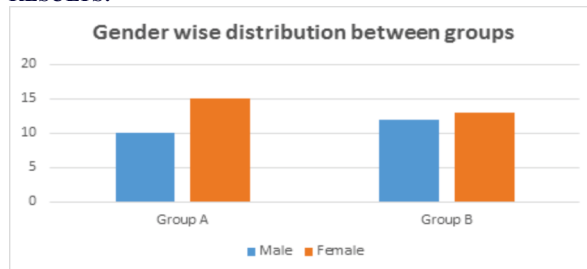


Table 1- Gender Wise Distribution Between Groups

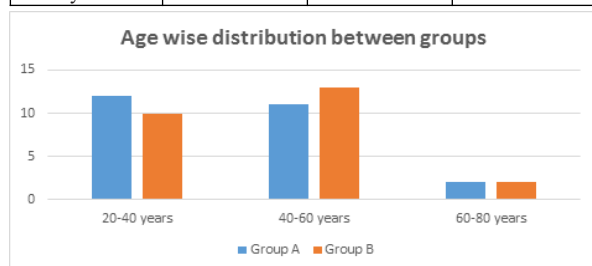
Table 1- Gender Wise Distribution Between Groups

Gender	Male	Female	p-value
Group A (Open)	10	15	0.11
Group B (Lap)	12	13	

As per table 1 there are 22 males and 28 female patients which show that the study was female preponderance. More females have undergone Open cholecystectomy but it was not significant. ($p>0.05$)

Table 2- Age Wise Distribution Between Groups

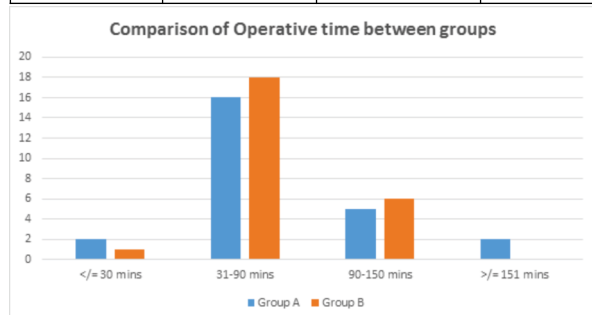
Age distribution	Group A (Open)	Group B (Lap)	p-value
20-40 years	12	10	0.31
40-60 years	11	13	
60-80 years	2	2	

**Graph 2- Age Wise Distribution Between Groups**

As per table 2 the most common age group was found to be 40-60 years (49%) followed by 20-40 years (47%) but it was not significant ($p>0.05$). Least common age group was 60-80 years.

Table 3- Comparison Of Operative Time Between Groups

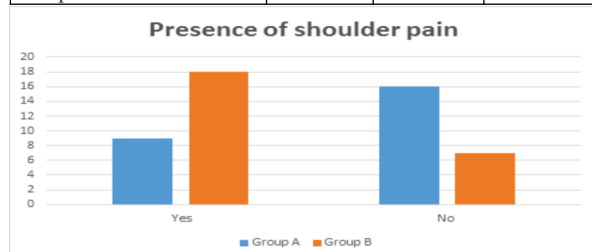
Operative time	Group A (Open)	Group B (Lap)	p-value
≤ 30 mins	2	1	0.15
31-90 mins	16	18	
90-150 mins	5	6	
≥ 151 mins	2	0	

**Graph 3- Comparison of Operative time between Groups**

As per table 3 the most common range of operative time was 31-90 minutes both in open and Lap chole and it was not significant which suggest that there is no comparison in operative time in both procedure. ($p>0.05$). Lap chole was slightly quicker as there were no more than 150 minutes procedures as compared to Open which has 2 procedures above 150 minutes

Table 4- Presence Of Shoulder Pain

Presence of shoulder pain	Yes	No	p-value
Group A	9	16	0.04*
Group B	18	7	

**Graph 4- Presence Of Shoulder Pain**

As per table 4 post-operative right shoulder pain was seen on 0, 1, 2 & 3 post-operative day in both procedures but it was highest in laparoscopic cholecystectomy and it was statistically significant ($p<0.05$). Most of the patients complained of shoulder pain were highest on post-operative day 1.

Table 5- Presence Of Shoulder Pain With Respect To Operative Time

Operative time	Presence of shoulder pain			
	Group A		Group B	
	Yes	No	Yes	No
≤ 30 mins	0	2	0	1
31-90 mins	7	9	15	3
90-150 mins	2	3	3	3
≥ 151 mins	0	2	0	0
p-value	0.11		0.03*	

As per table 5 association between shoulder pain and operative time was seen shoulder pain was higher in laparoscopic cholecystectomy with Operative time between 31-90 minutes and it was statistically significant which shows the more longer the procedure the chances of pain are higher.

Table 6- Presence Of Shoulder Pain With Respect To Drain Insitu

Drain insitu	Presence of shoulder pain			
	Group A		Group B	
	Yes	No	Yes	No
Yes	4	3	2	4
No	3	15	15	4
p-value	0.14		0.01*	

As per table 6 there was significant association of shoulder pain with drain insitu in laparoscopic cholecystectomy surprisingly the pain was higher when no drain was attached which was significant in Group B ($p<0.05$)

DISCUSSION:

The incidence of shoulder tip pain was almost unheard of in open cholecystectomy era and was first reported after laparoscopic gynecological procedures⁶. Early pain after laparoscopic cholecystectomy is multifactorial, due to surgical trauma to the abdominal wall at the port sites, local effect of carbon dioxide on the peritoneum, and distention of the abdominal wall and the diaphragm⁷.

Pain after laparoscopic cholecystectomy is due to a combination of the following components: incisional pain (somatic pain), visceral pain (deep intra-abdominal pain), and shoulder pain (referred somatic pain). Visceral pain accounts for most of the discomfort experienced in the early postoperative period and is distinctly different from shoulder tip pain⁸. The shoulder pain is significant on post-operative day 1 when the visceral pain component has decreased. Incidence of shoulder tip pain after laparoscopic cholecystectomy varies greatly with some studies reporting incidences as high as 30–50 %⁹. In our study, post-operative right shoulder pain was seen on 0, 1, 2 & 3 post-operative day but it was highest in laparoscopic cholecystectomy and it was statistically significant ($p<0.05$).

It was seen in our study that shoulder pain was higher in laparoscopic cholecystectomy with operative time between 31-90 minutes and it was statistically significant which shows that longer the procedure time, higher are the chances of pain. It was also seen that there was statistically significant association of shoulder pain with drain insitu in laparoscopic cholecystectomy. The pain was lower when drain was placed insitu. This could be due to the fact that pneumoperitoneum during the post-operative period is drained via the abdominal drain insitu.

A number of clinical trials have shown variable analgesic effects with a variety of methods including periportal infiltration of local anesthetics, intraperitoneal spraying above the gallbladder, and instillation into the subdiaphragmatic and subhepatic space covering the area of the hepatoduodenal ligament¹⁰. Bupivacaine administered in the subdiaphragmatic area is presumed to block noniceptive input generated from the inflamed diaphragmatic peritoneum¹¹.

Some studies have shown that the incidence and intensity of postoperative shoulder tip pain was significantly less in the low-pressure pneumoperitoneum group when compared with standard-pressure pneumoperitoneum groups^{9,12-14}.

CONCLUSION:

In our study it was seen that laparoscopic cholecystectomy had a significantly higher rate of post-operative shoulder tip pain which was maximum on post-operative day 1 and gradually decreased over time. There was a direct relationship between the duration of surgery and the post-operative shoulder tip pain.

More studies must be conducted with large sample size for in-depth analysis.

Limitation:

Small sample size, Retrospective study (etiology of cause could be identified better in a prospective study)

Conflict of Interest- None declared.

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