International Surgery Journal
Shakya JPS et al. Int Surg J. 2017 Feb;4(2):747-750
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20170226

Original Research Article

A comparative study of the incidence of pain and infection in gall bladder extraction via umbilical and epigastric port

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Received: 07 December 2016
Accepted: 04 January 2017

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ABSTRACT

Background: In laparoscopic cholecystectomy, gall bladder extraction via different ports has always been a matter of concern for the surgeons. This study is designed so as to determine the difference in the rate of pain and infection in gall bladder extraction via umbilical and epigastric port.
Methods: A prospective randomized study was done from January 2015 to December 2015 at S. N. Medical College, Agra in which 200 patients of cholelithiasis were considered. The patients were randomly selected in the operation theatre for gall bladder extraction via epigastric port (designated as Group-A with n = 100 patients) and gall bladder extraction via umbilical port (designated as Group-B with n = 100 patients).
Results: Post-operative pain at 24 hours, in terms of VAS was 3.67±1.42 in Group-A while 2.47±1.17 in Group-B with 10 being the worst pain. The p-value was calculated as .000048. The result is significant at p< .05. A total of eight patients out of two hundred patients suffered port site infections amongst which five were from Group-A (5%) and three were from Group-B (3%).
Conclusions: This study thus indicates that in laparoscopic cholecystectomy, gall bladder retrieval through the umbilical port is a better alternative to gall bladder extraction via epigastric port in terms of post-operative pain and port site infection. Our study recommends gall bladder extraction via umbilical port rather than epigastric port.

Keywords: Cholecystectomy, Epigastric port, Gall bladder extraction, Laparoscopic, Umbilical port

INTRODUCTION

Laparoscopic surgery, also called minimally invasive surgery or key whole surgery is a modern surgical technique in which operations are performed through small incisions (usually 0.5-1.5 cm) elsewhere in the body. In 1910 Hans Christian Jacobaeus of Sweden performed the first laparoscopic operation in humans.[1]

Laparoscopic cholecystectomy, introduced in 1987, is now the preferred method for cholecystectomy.[2] This surgical technique has been a milestone in the management of gall bladder disease by reducing postoperative pain, risk of surgical site infection and incisional hernia.[3] Laparoscopic cholecystectomy is also reported to have an advantage over open cholecystectomy due to shorter hospital stay, early return to work and overall low cost.[4]

Pain is the most frequent complaint after laparoscopic cholecystectomy and the main reason for staying overnight at hospital on the day of operation.[5] Pain after laparoscopic cholecystectomy depends on multiple factors including rupture of blood vessels caused by rapid distension of the peritoneum, traumatic traction on the nerves, trauma to the abdominal wall during port insertion and GB retrieval and pneumoperitoneum created by use of CO2 to maintain high abdominal

pressure.[5] It is reported that incisional pain is more intense than visceral pain and is dominant during the first 48 hours after laparoscopic cholecystectomy.[6]

Retrieval of GB is an important terminal event of laparoscopic cholecystectomy and is thought to be one of the factors affecting postoperative port site pain and infection. Gall bladder is either extracted from the epigastric or umbilical port. Both the ports have been recommended for retrieval of Gall Bladder in laparoscopic cholecystectomy, and are always selected as per surgeon's preference.[7-9] Till date, we have not been able to gather enough evidence which will support our theory.

This trial is undertaken to determine whether gall bladder retrieval from umbilical port is associated with more pain and infection at respective port site as compared to GB retrieval from epigastric port in adult patients undergoing four port elective laparoscopic cholecystectomy at a tertiary care hospital.

METHODS

200 Patients of Cholelithiasis at S. N. Medical College, Agra with required eligibility criteria were considered in this study from January 2015 to December 2015. The patients were randomly selected in the operation theatre for gall bladder extraction via epigastric port (designated as Group-A with n = 100) and gall bladder extraction via umbilical port (designated as Group-B with n = 100).

Routine blood investigations like CBC, SGOT, SGPT, PT and urine examination were carried out in all 200 patients. Ultrasound of the abdomen was done in all patients when they presented in the out-patient department or the emergency with complaints suggestive of cholecystitis.

In gall bladder extraction vis epigastric port, two 10 mm ports were inserted at infra-umbilical (open technique) and epigastric regions (closed technique). In gall bladder extraction via umbilical port, a 5 mm epigastric port is made along with a 10 mm umbilical port. Finally, 5 mm telescope has to be shifted to epigastric port to facilitate GB retrieval through umbilical port. Sheath of umbilical site was closed with absorbable suture (Vicryl) and skin with non-absorbable sutures (Prolene) without infiltration of local anaesthetic agent at wound margins.

Postoperative analgesia was standardized in both the groups. Intramuscular diclofenac sodium 1 mg/kg body weight was given 8 hourly in initial 24 hours of surgery only. The patients with significant pain i.e. who have VAS of 7 or more, despite being on standard analgesia, required additional analgesia (intravenous ketorolac as 0.3 mg/kg every 8 hourly) to alleviate pain at an acceptable level i.e. VAS of 3 or less.

All patients were kept nil per oral and on parenteral fluids till their bowel recovered. They were closely monitored in the post-operative period taking special care to chart the pulse rate, temperature and degree of pain, 4 hourly.

RESULTS

200 patients, diagnosed to have cholelithiasis underwent laparoscopic cholecystectomy from January 2015 to December 2015. They were divided into two groups: Group-A (gall bladder extraction via epigastric port), Group-B (gall Bladder extraction via umbilical port). Both the groups were comparable for the baseline variables (Table 1).

Table 1: Comparison of both the groups.

	Group-A (epigastric port)	Group-B (umbilical port)
No of patients	100	100
Sex (M:F) ratio	3:17	7:13
Age range (years)	16-70	17-60
Mean age (years)	38.9	35.7

A total of eight patients from two hundred suffered port site infections amongst which five were from Group-A and three were from Group-B. Among the five patients from Group-A, one patient was a known diabetic (Table 2).

Table 2: Incidence of port site infection in both groups.

	Group-A (n = 100)	Group-B (n = 100)
No of patients with port site infection	5	3
Percentage (%)	5	3

In this study, post-operative pain, in terms of VAS was 3.67±1.42 in Group-A while 2.47±1.17 in Group-B with 10 being the worst pain. The p-value was calculated as 0.000048. The result is significant at $p< 0.05$ (Table 3).

Table 3: Comparison of post-operative pain in terms of mean vas score.

Treatment groups	Total no. of cases (N)	Mean of VAS	Standard deviation	Standard error of mean
Group-A	100	3.675	1.421	0.225
Group-B	100	2.475	1.176	0.186

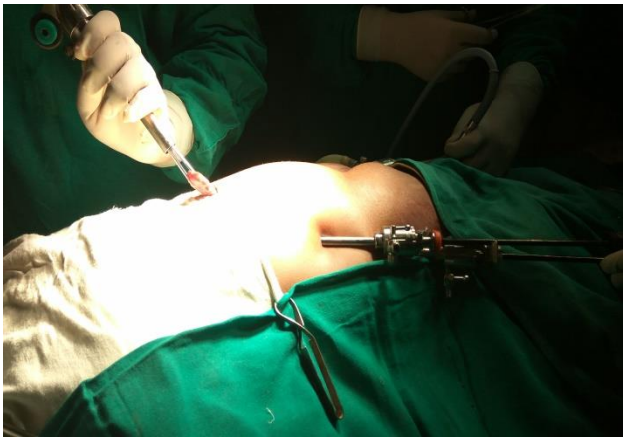

Figure 1: Gall bladder extraction via epigastric port.

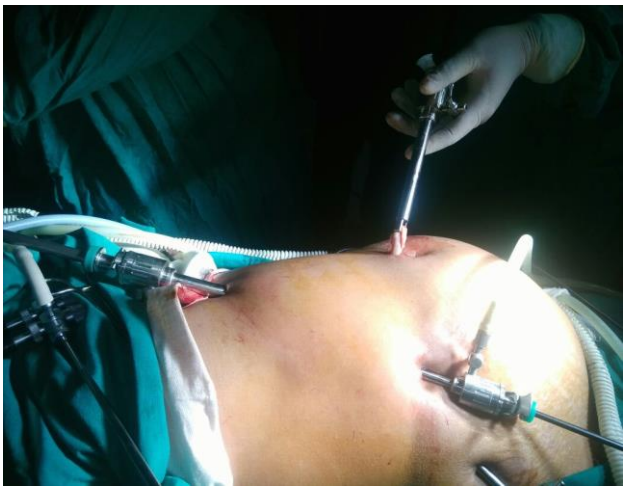

Figure 2: Gall Bladder extraction via umbilical port.

This value was calculated for comparing two sample population means at 5% significance level (one sided) and 80% power and a sample of 100 patients in each arm. Categorical port site pain is compared in both the groups by student's T-test. P-value of less than 0.05 was considered statistically significant.

None of the patients developed jaundice in the post-operative period. No mortality was observed during the study.

These figures show a difference in approach of gall bladder extraction via epigastric port and umbilical port respectively (Figure 1, 2).

DISCUSSION

Numerous reports indicate that laparoscopic cholecystectomy can be done safely for patients with acute cholecystitis (Prakash et al, Suter and Meyer).[10] Although this remains a fact that several surgeons encounter various kinds of difficulty during this procedure.[11-14]

There are a lot of controversies regarding the better port during extraction of gall bladder. Retrieval of gall bladder through a particular port is also associated with further tissue trauma at port site and hence considerable degree of post-operative port site pain. Therefore, the ideal port for this purpose will be the one with lesser post-operative port site pain and where less port site infection is seen.

In our study, post-operative pain, in terms of VAS was 3.67±1.42 in Group-A while 2.47±1.17 in Group-B with 10 being the worst pain. The p-value was calculated as 0.000048. The result is significant at $p<0.05$ with umbilical port being the better port for extraction.

This is in support of the results by Siddique et al who considered umbilical port to be the better port in terms of VAS. In their randomized control trial of 120 patients, patients were randomized to either group A (n = 60, GB retrieval through epigastric/sub xiphoid port) or group B (n = 60, GB retrieval through umbilical port).[15] VAS for pain was assessed by a registered nurse at 1, 6, 12, 24 and 36 h after surgery. The VAS for pain at umbilical port was less than subxiphoid port at 6, 12, 24 and 36 h after surgery (5.9±1.1 versus 4.1±1.5, 4.6±0.94 versus 3.5±1.05, 3.9±0.85 versus 2.4±0.79, 3.05±0.87 versus 2.15±0.87, respectively) and the difference was statistically significant (p-value < 0.001).

This result is contradictory to the results of the study by Bashir et al where post-operative pain score in the study came out 3.54±1.034 in sub xiphoid group while 3.11±1.368 in umbilical group on visual analogue scale of 10 with 10 as worst pain. The difference in 24-hour postoperative pain score was statistically non-significant (p value = 0.089)

Similarly, it is also contradictory to the study by Ahmad et al where post-operative pain score in their study came out 3.70±1.02 in Sub xiphoid Group while 3.37±1.3 in umbilical group on visual analogue scale of 10 with 10 as worst pain. The difference in 24-hour postoperative pain score was statistically non-significant (p = 0.28).

In our study, a total of eight patients out of two hundred patients suffered port site infections amongst which five were from Group-A (5%) and three were from Group-B (3%).

CONCLUSION

Experience with laparoscopic gall bladder retrieval has been presented in this study. A prospective review has been made, to compare the difference between gall bladder extraction via umbilical port and epigastric port in terms of pain and infection.

Our study indicates a statistically significant reduction in post-operative pain in gall bladder extraction via umbilical port as compared to that of epigastric port.

Further the Port site infection is also lower in Group-B patients (gall bladder extraction via umbilical port).

This study thus indicates that in laparoscopic cholecystectomy, gall bladder retrieval through the umbilical port is a better alternative to gall bladder extraction via epigastric port in terms of post-operative pain and port site infection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Shakya JPS, Agrawal N, Kumar A, Singh A, Gogia B, Yadav C. A comparative study of the incidence of pain and infection in gall bladder extraction via umbilical and epigastric port. Int Surg J 2017;4:747-750.