

Retrieval of Gallbladder through Subxiphoid V/S Supraumbilical Port in Laparoscopic Cholecystectomy.

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Abstract:

BACKGROUND

Aim- Diseases of gallbladder have presented for a long time. Before era of laparoscopic open cholecystectomy was the procedure of choice but invention of laparoscopy made it the procedure of choice for elective cholecystectomy. The operation of laparoscopic cholecystectomy is still evolving with time and the size, number of ports is reducing day by day. This prospective, randomised pilot study was done to compare the extraction of gallbladder through epigastric/subxiphoid port v/s supraumbilical port in laparoscopic cholecystectomy in terms of operative time, complications, extension of the incision, hospital stay, cosmesis, ease of use and acceptability by both the patient and surgeon.

MATERIALS AND METHODS

60 patients undergoing laparoscopic cholecystectomy were taken up for study. The patients were divided into two groups A and B, each consisting of 30 patients. In Group A gallbladder was extracted through epigastric port and in Group B gallbladder extracted via supraumbilical port. The findings of subgroups were compared and results was evaluated by using 'p' (determined by chi-square test) and 't' (determined using degree of freedom and standard deviation) values.

RESULTS

Females were found to be more prone to cholelithiasis. The mean operative time in Group A was 33.3 mins. and in Group B was 33.1 mins. Both the groups were comparable in terms of intraoperative complications, technical ease and feasibility. Port site infection was seen in 2 patients. The port used for extraction was the one, which became the site of infection. Port site pain was found to be most commonly associated with the epigastric port irrespective of whether it was used for extraction of gallbladder or not. Port site hernia was seen in only one patient in supraumbilical port site, which was found to be non-significant statistically.

CONCLUSION

It was concluded that both ports are equally efficient in terms of gallbladder extraction without any major complications or the time taken but port site pain was found to be most commonly associated with the epigastric port irrespective of whether it was used for extraction of gallbladder or not. Thus, reducing the size of epigastric port to 5 mm may reduce the morbidity.

Keywords: Laparoscopic Cholecystectomy; Cholelithiasis; Gallbladder Retrieval; Umbilical Port; Sub-Xiphoid Port, Supraumbilical Port

Date of Submission: 30-07-2018

Date Of Acceptance: 13-08-2018

I. Background

The diseases of gallbladder have presented for a long time. Cholelithiasis has plagued the mankind for over 2000 years.¹ Jean-Louis Petit, the founder of gallbladder surgery in 1733 suggested removal of gallstone and drainage of the gallbladder, thus creating fistula in patients with empyema, which he successfully performed in 1743.² Langenbuch's open cholecystectomy remained the Gold Standard for symptomatic cholelithiasis for over a century.³

Gallbladder disease is a common occurrence, particularly in females. The high occurrence of gall stones has become apparent since introduction of Ultrasonography. Cholecystectomy is the commonest operation of the biliary tract and the second most common operative procedure performed today.⁴

First laparoscopic cholecystectomy recorded in medical literature was performed by Mouret.⁵ There are many advantages of laparoscopic cholecystectomy over open cholecystectomy like shorter hospital stay, reduced pain, better cosmetic outcome.⁶ However, it has certain problems like high cost of instruments and surgical expertise needed to perform the procedure. The operation of laparoscopic cholecystectomy is still evolving with time and size and number of ports is reducing day by day. Single port laparoscopic cholecystectomy is a reality today and may very well be the standard procedure in near future. In a standard 4

port laparoscopic cholecystectomy, the extraction of gallbladder is accomplished through the supraumbilical port after dissection of the gallbladder from its bed.

At this point, the telescope is moved from the supraumbilical port to the epigastric port, the gallbladder is grasped with a 10 mm grasper introduced through the umbilicus and the gallbladder and port removed.⁷ Nafeh A I et al have reported using the epigastric port for extracting gallbladder during three port laparoscopic cholecystectomy successfully.⁸

Beckingham has been using the umbilical port for extracting the gallbladder. He found this technique of gallbladder extraction to be safe and reliable.⁹ Carapeti E et al have done a study on abdominal wall abscesses and sinus tracts, which are being increasingly recognised as complications of laparoscopic cholecystectomy. They found out that most cases were associated with spilled gallstones when the gallbladder is extracted through the epigastric port. Authors suggested that extracting the gallbladder through the umbilical port may reduce the likelihood of such complications.¹⁰

II. Materials and methods

60 patients of either sex were admitted for laparoscopic cholecystectomy were taken for present study. The patients were assigned randomly to one of the two groups alternatively: A and B, each consisting of 30. The allocation to group was done alternatively, i.e. from same population one patient to Group A and next patient to other Group B and so on. Epigastric port was used for gallbladder extraction in patients of Group A, while supraumbilical port was used for extraction of gallbladder in the patients of Group B. All patients irrespective of age and sex were included in the study.

Pregnant patients and patients having coagulation disorders were excluded from the study. A detailed clinical evaluation of each case was done including proper history, physical findings, investigations and pre-operative, operative and post-operative findings. Patients of both the groups had similar pre-operative investigations before surgery.

Procedure

All were operated by standard four port laparoscopic technique under general anaesthesia. The Veress needle was inserted through a stab incision in the supraumbilical region and pneumoperitoneum created; 10 mm telescope port was made at Veress needle site and endoscope was introduced through the port. Then 10 mm working port in the epigastric area was put 1 - 2 cms below the subcostal margin. Two 5 mm ports in right mid-clavicular line in the subcostal region and in anterior axillary line at level of umbilicus were put. The right lateral port was used for retracting the gallbladder. Epigastric and right medial ports were used as working ports. Then the Calot's triangle dissection was done. The cystic duct was cut in between the clips and the cystic artery was also divided in a similar manner. Then gallbladder was dissected from liver bed with monopolar diathermy hook.

In Group A

The gallbladder was extracted through the epigastric port.

In Group B

The gallbladder was extracted through supraumbilical port.

Operative time was noted down. Any intraoperative complication was recorded. Post-operative assessment regarding temperature, pulse, blood pressure and post-operative pain were noted. After surgery, post-operative complications namely post-operative drain volume, post-operative bleeding, port site infection and port site hernia was recorded for the first week, after 1 month and after 3 months. The findings of subgroups were compared and results was evaluated by using 'p' and 't' values. Chi-square test was used to determine 'p' value and degree of freedom (DF) and standard deviation were used to determine 't' value. A p value of < 0.05 was considered statistically significant.

III. Results

Age

Our youngest patient was 21 yrs. old and oldest was 68 yrs. old. Mean age of patients in this study was 44.5 yrs.

Sex

Majority of the patients in this study were females in both the groups, i.e. 80% in Group A and 93% in Group B. Ratio to female-to-male patients in Group A is 4: 1 and in Group B is 14: 1.

Chief Complaints of Patients

Pain abdomen was the most common presenting symptom (77% in Group A and in 63% patients in Group B). Pain and vomiting was present in 7% in Group A and in 10% in Group B. Pain and dyspepsia were the chief complaints in 10% and 17% patients in Groups A and B respectively.

	Range (Min)	Mean (Min)	SD
Group A Epigastric	20 - 50	33.33	7.23
Group B Supraumbilical	20 - 50	33.16	7.25
Df = 58; t = 0.0909; p = 0.92 (non-significant)			
Table 1. Operating Time Comparison			

The mean operative time in Group A was 33.33 min. and in Group B was 33.16 min. Chi-square test and 't' statistics showed that the difference was non-significant between the two groups (t = 0.0909, p = 0.92).

Intraoperative Complications

No superior epigastric artery injury was seen in both the groups. The incidence of GB injury (perforation) was 6% in both the groups. Stone spillage occurred in the 2 cases in epigastric group and in one case in supraumbilical group, all the calculi were retrieved with a stone holding forceps.

Conversion to Open Cholecystectomy

One patient in the supraumbilical group was converted to open cholecystectomy, i.e. an incidence of 3% only due to dense adhesions in the Calot's area. No case in the epigastric group was converted to open.

	Group A Epigastric	%	Group B Supra-umbilical	%	χ^2	p
No. of Patients	2	6%	1	3%	0.351	0.55 (NS)
Table 2. Extending of Port Incision for Extraction of Gallbladder						

The patients requiring extending of the extraction port were all having single stones with size \geq 2 cm; 2 patients in Group A (6%) required extension of the epigastric port and 1 (3%) patient in the supraumbilical port Group B required the extension.

	Group A Epigastric	%	Group B Supraumbilical	%	P
Post-op bleeding	0	-	0	-	1, NS
Ileus	0	-	0	0	1, NS
Peritonitis	0	-	0	-	1, NS
Port site Infection	1	3	1	3	1, NS
Port site hernia	0	-	1	3	0.31, NS
Table 3. Post-Operative Complications					

Port site infection was present in 1 patient (3%) in both the groups. It was a small stitch abscess which responded to local drainage, dressing and oral antibiotics. Port site hernia was seen in one patient in the Group B in the supraumbilical port site at 3 months of followup. Applying chi-square test and 't' statistics, it was observed that none of the complications were statistically significant.

	Range (Days)	Mean (Days)	SD
Group A Epigastric	2 - 3	2.3	0.47
Group B Supraumbilical	1 - 4	2.4	0.68
t = 0.66, df = 58, p = 0.51 ns			
Table 4. Hospital Stay Comparison			

Mean hospital stay was 2.3 days and 2.4 days in Group A and B respectively. Three patients were discharged on the same day. Statistical analysis was done by applying chi-square test and 't' value showed that the difference between the two groups was not significant (t = 0.66, p = 0.51).

	Group A (Epigastric)	%	Group B (Supraumbilical)	%	Total	Chi Sq.	P
Non-specific	11	37	10	33	21	0.073	0.7866 (ns)
Epigastric	15	50	10	33	25	1.714	0.19 (ns)
Supraumbilical	4	13	9	30	13	2.455	0.117 (ns)

Table 5. Port Site Pain (1st Day/Initial Post-Op Period)

In Group A, 11 patients had non-specific pain. Epigastric port was the most painful site in 15 patients (50%) in Group A and supraumbilical port was the predominantly painful port site in 4 patients (13%) only. In Group B 10 (33%) patients had nonspecific pain, 10 (33%) patients had predominantly epigastric port pain and 9 (30%) patients had supraumbilical port as the most painful site. Applying Chi square test, difference between the two groups in terms of the most painful port site was found to be non-significant. Overall, the epigastric port site was the most commonly painful site in both the groups.

IV. Discussion

Gallstones are among the most common gastrointestinal illness requiring hospitalisation and frequently occur in young, otherwise healthy people. The increasing acceptance of surgical therapy for gall stone disease and its consequences over past 100 years is the result of availability of accurate methods of diagnosis, the safety and the ease with which the operations are accomplished and the satisfactory long-term relief of symptoms and interruption of pathological process involved.¹¹ Laparoscopic cholecystectomy is considered to be the procedure of choice for elective cholecystectomy.¹² In the present study, we compared advantages and disadvantages for extraction of gallbladder through the epigastric v/s supraumbilical ports.

Age

In our study, age in Group A varies from 21 yrs. to 68 yrs., whereas in Group B varies from 22 yrs. to 66 yrs. 25% of patients were in the 5th decade of life and 25% in 6th decade. Our youngest patient was 21 yrs. old and oldest was 68 yrs. old.

Average age of presentation of cases of cholelithiasis was 44.5 years, comparable to various studies as reported 54, 47 and 45 years by Singh et al (2010), William et al (1972)¹³; Gordan et al (1976)¹⁴ and Danlel et al (1982)¹⁵ respectively. It means that the disease is most common in the 5th decade of life.

Sex

Majority of the patients in our study were females in both the groups with ratio of female-to-male was 6.5: 1, comparable to various studies like Singh et al (2010), Kambouris et al (1973)¹⁶ and Pathania et al (1989).¹⁷

Symptoms

In this study, pain abdomen was the presenting symptom in 70% in both groups. In the study by Singh et al (2010), pain abdomen was the presenting symptom in 52% of the patients. Pain and vomiting was present in 14%. Pain, vomiting and dyspepsia was present in 18%. In studies done by McMahon et al, 1994, dyspepsia was present in 32% - 82% of patients with gall stones. In a study by Singh et al (2003),¹⁸ dyspepsia was present in 40% of the patients.

Operating Time

The mean operative time in Group A was 33.33 mins. and in Group B was 33.16 mins. The maximum time in both Group A and Group B was 50 mins. (Table 1). In a study by Singh et al (2010), the mean operative time was 50.5 minutes. Statistical analysis showed that the difference between the two groups was not significant. A retrospective survey in 1991 of 7 European Centres involving 20 surgeons who undertook 1236 laparoscopic cholecystectomies showed a median operative time of 50 minutes (Cuschieri et al, 1991).¹⁹

Intraoperative Complications Encountered

In this study, no superior epigastric artery injury was seen in both the groups. The incidence of GB injury (perforation) was 6% in both the groups. Stone spillage occurred in the 2 cases in epigastric group and 1 case in supraumbilical group, where all the calculi were retrieved with a stone holding forceps. In a study by Singh et al (2010), the incidence of gallbladder injury was 6% overall. Perforation of the gallbladder during its separation is a common complication, which is encountered in 15% of reported cases. Its importance lies in the escape of stones, which must all be retrieved if at all possible. Fundal perforation is easily remedied by the application of an endoloop. Perforation of the under surface can only be controlled by suturing. If the surgeon has not yet acquired the necessary skills for intracorporeal suturing, the best option available is to empty the

gallbladder of stones into a bag introduced through one of the ports. Once this is achieved, the detachment of the gallbladder from the liver is completed. There is a definite risk of intra-abdominal abscess formation in patients in whom gallstones are missed. This risk is small and does not warrant conversion. However, these patients should be put on an antibiotic course for 5 - 7 days and followed up by ultrasound examination at six months after the procedure.²⁰

Technical Ease and Feasibility

There was no statistically significant difference between the two groups in terms of operative time or intraoperative complications, thus both the methods were found to be equally feasible technically by the surgeon.

Post-Operative Complications

There was no case of post-operative bleed, peritonitis or ileus in both the groups. There was one case in each group, which had port site infection i.e. an incidence of 3% in both the groups (Table 3), the case in Group A was a case of empyema gallbladder and the case in Group B was a diabetic. Both the cases were that of local stitch abscess, which responded to removal of the suture and local dressing and oral third generation antibiotics.

There was one case of port site hernia at the supraumbilical port in Group B at 3 months of followup. This was the same case, which had port site infection which responded to local drainage and oral antibiotics. The patient underwent a laparoscopic mesh repair later.

In the study by Singh et al (2010), the incidence of port site infection was 4%. The wound infection rate observed by other surgeons in laparoscopic cholecystectomy is 0.4%, Cuschieri et al 1991.¹⁹

Hospital Stay

In our study, the mean hospital stay in Group A was 2.3 days and in Group B was 2.4 days comparable to various studies Cuschieri et al (1991).¹⁹

Mortality

In our study, there was no mortality in both the groups. This is comparable to studies by Peter et al 1991,²¹ where there was 0% mortality in laparoscopic cholecystectomy.

Cosmesis

No difference in cosmesis was seen between the two groups.

Cost Effectiveness

Both the study groups had no difference in the overall cost of the operation.

V. Conclusion

Gallbladder disease was found to be more common in 5th and 6th decade of life. Pain was the most important symptoms, which compelled the patient to seek treatment. Both epigastric and supraumbilical groups were comparable in terms of intraoperative complications and post-operative complications. Both epigastric and supraumbilical incisions can be extended for extraction of gallbladder when needed safely without any complications and were found to be comparable in terms of technical ease and feasibility. Port site pain was found to be most commonly associated with the epigastric port, irrespective of whether it was used for extraction of gallbladder or not.

Hence, we conclude that both the ports can be used for gallbladder extraction without any major complications as long as both the ports are 10 mm in size without any advantage of one over the other. It is highly recommended that the size of epigastric port be reduced to 5 mm to reduce post-operative port site pain.

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Dr Mohammad equal Ahmad "Retrieval of Gallbladder through Subxiphoid V/S Supraumbilical Port in Laparoscopic Cholecystectomy.." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 17, no. 8, 2018, pp 36-41.