Retrieval of Gallbladder Through Epigastric Vs Umbilical Port After Laparoscopic Cholecystectomy

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ABSTRACT

Objective: To compare the effectiveness of epigastrics vs. umbilical port after laparoscopic cholecystectomy by measuring the time taken to retrieve the gall bladder, post-operative pain, and infection.
Study Design: Comparative prospective study.
Place and Duration of Study: Department of Surgery Combined Military Hospital Abbottabad, from Jan to Jun 2019.
Methodology: A total of 106 patients underwent laparoscopic cholecystectomy. Patients were randomly divided into two groups. Inclusion criteria were patients with symptomatic gallstones. Exclusion criteria were patients with comorbid medical conditions, acute cholecystitis, Empyema gall bladder, bile or stone spillage, and BMI >40. Time taken to retrieve the gall bladder, pain, and wound infection were used to compare the effectiveness of port sites. The results were collected on proforma and analyzed by using SPSS version 23.
Results: Total 106 patients, having mean age of 45.90 ± 14.49 years. Gender distribution was similar (p=0.314). Retrieval time of gall bladder in epigastric group was 9.2 ± 2.98 and in umbilical group 9.73 ± 3.57 this difference was insignificant (p=0.516). In epigastric group pain was perceived in 3.69 ± 1.77 and in umbilical group 3.28 ± 1.39 with p-value of 0.062 which was non-significant. Wound infection in epigastric group was 1.07 ± 0.266 and in umbilical group 1.05 ± 0.233 with p-value of 0.439 which was in significant.
Conclusion: Both port sites are equally effective and depend on Surgeon's preference.

Keywords: Laparoscopic cholecystectomy, Symptomatic gallstones, Umbilical port.

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INTRODUCTION

First open cholecystectomy was done by Carl Langen buch in 1882 for cholelithiasis. Eric Muche in Bolingen Germany, and Philippe Mouret in Lyon, France are pioneers in laparoscopic cholecystectomy on the planet and they performed their first ever laparoscopic cholecystectomy in 1985 and 1987 independently. In 1988 two groups of American surgeon also performed the laparoscopic cholecystectomy. In 1990 only 10% of the gall stone cases were operated by laparoscope in America. Since then there was significant rise in laparoscopic cholecystectomy. In 2006, 88% of the cases of cholelithiasis were operated laparoscopically in America. Laparoscopic Cholecystectomy was a significant progression in improving recovery of the patients, which permittedthe patients to have better personal satisfaction in early postopera-tive period. Although further randomized trials came late but they showed the clear benefit of Laparoscopic Cholecystectomy over open cholecystectomy due to fast recovery and lessseverity of pain.[1]

Since then laparoscopic cholecystectomy is consider as gold standard for treatment of gall stone disease.[2] After the start of laparoscopic surgery for gall bladder disease different types of gall bladder extraction gadgets have been utilized to extract the gall bladder from the peritoneal cavity. These range from simple non-powdered gloves to several types of commercially available sacks usually called endo bags.[3,4] In laparoscopic cholecystectomy,utilization of recovery gadgets is thought to give the further advantage to reduce the danger of stone and bile spillage into the peritoneal cavity, consequently decreasing the opportunity of contamination of peritoneal cavity and port site thus further reduces the incidence of infection. But the use of gall bladder recovery gadgets makes retrieval of the specimen more difficult, this may require extension of the port site incision and there is risk to injure the abdominal organ during bag insertion and recovery.[5,6] This may result in extended stay in hospital.[7] In elective cholecystectomy there is less chance of progressive inflammatory disease especially when gall bladder is dissectedeasily from the gall bladder bed without spillage of bile or stone.

Some surgeons after laparoscopic cholecystectomy prefer epigastric port and others prefer umbilical port to extract the gall bladder. One study favor

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theepigastric port for retrieval of gall bladder because it is easy for surgeon as there is no need to shift the telescope to other port as incase of umbilical port which involves shifting of telescope to epigastric port while other study shows umbilical port is better in terms of post op pain.[8,9,10]

Our study was to determine which port i.e., epigastric versus umbilical is effective for retrieval of gall bladder in four port laparoscopic cholecystectomy for gall bladder extraction time, postop pain and infection. This will result in enhancement of the technique, reduce operative time and over al cost benefit.

METHODOLOGY

This study was a comparative prospective conducted at department of Surgery, Combined Military Hospital Abbottabad after approval of study by ethical review committee of the hospital vide certificate no 131/Adm /07 dated 1st Jan 2019 and was carried out from Jan to June 2019. There was a requirement of minimum 51 patients in each group. Sample size was calculated assuming expected times for gall bladder retrieval if 10 ± 4.5 minutes in group A and 8 minutes in group B, alpha of 0.05% and power 80%. The expected timings were based on a study by Ahmad, *et al*.

Inclusion Criteria: Patients of either gender who underwent laparoscopic cholecystectomy were included in the study.

Exclusion Criteria: Patient with comorbid medical conditions, acute cholecystitis, empyema gall bladder, bile or stone spillage, and BMI >40 were excluded from the study.

The patients were randomized to two groups Group A for epigastric port and Group B for umbilical port by random number generation. Inclusion criteria consist of patients with symptomatic gall stone which was confirmed on abdominal ultrasound. Data was collected on proforma which also consist of demographic detail of the patient. Informed consent was taken from all the patients before general anesthesia was administered. All patients were given prophylactic antibiotic with pre medication (inj Dexamethasone 4 mg & Injmax alone) at the time of induction of anesthesia and two doses afterward with an interval of 12 hours. Time to retrieve the gall bladder was defined as the time after completion of calot's triangle dissection clip application at cystic duct and artery, dissection of gall bladder from gall bladder fossa, confirmation of hemostasis and suction irrigation.

After laparoscopic cholecystectomy, the gall bladder was removed through the epigastric port or umbilical port by using a large 10 mm claw grasper 2x3 teeth of karlstorz Germany (commonly known as crocodile forceps) through the epigastric port in which position of surgeon and telescope remain the same but the retrieval of gall bladder through umbilical port includes change in position of surgeon and telescope by shifting the telescope to epigastric port. The gall bladder was grasped through the transected end of cystic duct, under direct vision and pulled through the epigastric or umbilical port out as far possible. When the gall bladder was small enough, it could be retrieved in trocar sleeve, and the trocar sleeve along with gall bladder removed.

When the gall bladder is filled with large stones it was opened at the port site suction of bile was done and stones were removed by using disjordin or scoope forceps or by enlarging the skin incision. Post-operative perceived pain was measured by using the visual analog scale of 10 and was noted by nurse after every 6 hrs in the ward during the first 24 hrs. 10 was considered the worst scale of pain. Postoperatively after 48 hrs first aseptic dressing (Mepore) was changed. But it was removed earlier in patient who developed infection characterized by fever, increasing pain, swelling, redness and pus discharge from the port site by using the ASEPSIS Scoring System Patient's record were maintained on the pre-designed proforma having demographic details, time to retrieve the gall bladder, any sign of wound infection like inflammation at the port site or pus discharge and fever.

Data was analyzed by using SPSS-23. Qualitative variables like age and gender were calculated by mean and standard deviation. Independent sample t test was used to find out significant difference in quantitative variables like time taken in retrieval of gall bladder, average pain and wound infection in both groups.

RESULTS

Total 106 patients, having mean age of 46 ± 14 years, were included in this study. The mean age in epigastric group was 47 ± 13 and in umbilical group was 46 ± 15 years respectively (p=0.613). The two groups had similar gender distribution: 17 (32.08%) males in epigastric group and 22 (41.51%) in umbilical group (p=0.314) as shown in Table-I. Retrieval time of gall bladder in epigastric group was 9.2 ± 2.98 and in umbilical group was 9.73 ± 3.57. This difference was insignificant with a p-value of 0.516 as shown in Table-II. In epigastric group pain was perceived in 3.69 ± 1.77

and in umblical group 3.28 ± 1.39 with *p*-value of 0.062 which was non-significant in Table-III. Wound infection in epigastric group was 1.07 ± 0.266 and in umbilical group 1.05 ± 0.233 with *p*-value of 0.439 which was in significant in Table-IV.

Table-I: Descriptive statistics.

Parameters		Epigastric port Mean ± SD (n=53)	Umbilical port Mean ± SD (n=53)	*p*-value
Age		47.19 ± 13.44	44.6 ± 15.5	0.613
Gender	Male	17 (32%)	22 (42%)	
	Female	36 (68%)	31 (58%)	0.314

Table-II: Time taken for gallbladder retrieval in epigastric/ umbilical port.

Port Site	n	Mean ± SD	*p*-value
Epigastric	53	9.2642 ± 2.988	0.516
Umbilical	53	9.7358 ± 3.5742	

Using independent sample t-test

Table-III: Comparison of post op pain (Visual Analog Score).

Port Site	n	Mean ± SD	*p*-value
Epigastric	53	3.6981 ± 1.7714	0.062
Umbilical	53	3.2830 ± 1.3919	

Using independent sample t-test

Table-IV: Comparison of wound infection.

Port Site	n	Mean ± SD	*p*-value
Epigastric	53	1.0755 ± 0.2666	0.439
Umbilical	53	1.0566 ± 0.2333	

Using independent sample t-test

DISCUSSIONS

Laparoscopic cholecystectomy is presently the gold standard procedure for symptomatic cholelithiasis. During laparoscopic procedure we come across certain issues which are not addressed adequately,[11,12] such as port site to retrieve the gall bladder. Some studies have favored umbilical port for retrieval ofgall bladder and others have favored epigastric port, in terms of less effort for surgeon and time. However, most of studies did not consider epigastric or umbilical port site collectively for post operative pain, time for retrieval of gall bladder and infection. A study by Majid *et al,* concluded that there is no benefit in using retrieval bag in elective uncomplicated laparoscopic cholecystectomy.[13] Current study addresses all the above issues.

Age distribution ranged from 20 to 85 years. This show an early onset of symptomatic cholelithiasis in Pakistani population,[1] this is in accordance with other studies. Generally female populations suffer more from cholecystitis,[15] therefore more females underwent cholecystectomy.[16] We had observed the same results in our study. Gender distribution for time to retrieve the gall bladder through epigastric or umbilical port was equal as shown in Table-I.

In our study gall bladder retrieval mean time was 9.26 ± 2.98 minutes in epigastric group while 9.733 ± 3.57 minutes in umbilical group which shows that both groups have no significant difference (*p*=0.516). A propos mean time taken for delivery of gall bladder results in our study are similar to those presented by Abbas *et al,*[8] who showedrange of 2-12 min for umbilical port and 3-16 min for epigastric port to retrieve the gall bladder. Time to retrieve the gall bladder was statistically insignificant (*p*=0.909) in our study. Therefore our study also shows that from surgeon's point of view the difficulty level for the retrieval of gall bladder from both ports in terms of time is same.

In our study average pain score for epigastric group was 3.69 ± 1.77and for umbilical group was 3.28 ± 1.39 on visual analogue scale of 10 with a *p*-value of 0.062 which was statistically non-significant (Table-III). Our study result for pain score is same as seen in results of Shabir *et al,*[17] which is a trial of 60 patients [*p*=0.28], and the results of our study were different from results of Siddique *et al,*[18], which was RCT of 120 patients showed statistically significant difference (*p*< 0.001) for pain at both port site and demonstrated that pain was less at the umbilical port.

In our study wound infection was 1.075 ± 0.266 in epigastric group and 1.056 ± 0.233 in umbilical group and *p*-value is 0.439 which is statistically nonsignificant. Our study results are same as Cemal kaya *et al,* in RCT of 120 patients showed no statistical difference in terms of port site infection.[19] Spaziani *et al,* showed 4.3% infection at umbilical port site.

But in our study infection was observed at both port sites equally.[20] Moreover low rate of wound infection was attributed to our exclusion criteria in which patients of acute cholecystitis, empyema gall bladder, spillage of bile and stone and with comorbidities were excluded.

STUDY LIMITATIONS

Limitation of our study was that only right handed surgeons were included in the study,result may be different for left handed surgeons. Limited data was used to evaluate the result and it is a single centered study. Moreover size and number of gall stones were also not considered in the current study.

CONCLUSIONS

Current study concludes that retrieval of gall bladder from either umbilical or epigastric port is surgeon's

prerogative without any significant difference in time of retrieval, post op pain or infection.

Conflict of Interest: None.

Authors' Contribution

MYA: Direct contibutution, RAH: Data analysis, MA: Critical reviewer.

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