ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor (RJIF): 8.4
IJAR 2024; 10(6): 299-302
www.allresearchjournal.com
Received: 03-03-2024
Accepted: 07-04-2024

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A randomized comparative study of postoperative port-site pain in epigastric vs. umbilical port after gall bladder retrieval in patients undergoing laparoscopic cholecystectomy

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Abstract
Background: Gall bladder (GB) retrieval is a major reason for postoperative discomfort following laparoscopic cholecystectomy (LC). GB is commonly retrieved either via the epigastric or the umbilical port and there are insufficient data to evaluate the advantage of one over other in terms of postoperative pain. The purpose of this research was to evaluate postoperative port-site discomfort after laparoscopic cholecystectomy gall bladder removal from an umbilical vs an epigastric port.
Materials and Methods: A comparative study conducted in SMS hospital in 60 patients, 30 patients in each group. Group A- GB retrieved from umbilical port, Group B-GB retrieved by epigastric port. Every patient's pain was measured at both port locations at 1, 6, 12, 24, and 36 hours after surgery. Following their release, the patients were monitored in surgery OPD on the fifth postoperative day, and any problems following the procedure were noted.
Results: The VAS score for postoperative pain at the epigastric port was found to be higher at 1, 6, 12, and 24 hours compared to the umbilical port. The scores were 3.366 ± 0.764 vs. 4.066±0.907, 3.266±1.014 vs. 3.866±0.937, 3.333±0.922 vs. 4.366±1.033, and 3.366±0.927 vs. 4.733±1.172, respectively. This difference was statistically significant with a P value of 0.001. However, the amount of time it took to retrieve gallbladder (GB) was much greater in the umbilical group, with an average duration of 5.5 ± 1.19 compared to 4.6 ± 0.758 in the other group.
Conclusion: The umbilical port is superior to the epigastric port for gallbladder retrieval in patients having elective four-port laparoscopic cholecystectomy, since it results in less postoperative discomfort at the port site. However, it does need a comparatively longer time for extraction.

Keywords: Gall bladder, laparoscopic cholecystectomy, umbilical port, epigastric port, VAS score

1. Introduction
Cholecystectomy performed laparoscopically, which was first performed in 1987, is now the procedure of choice for cholecystectomy [1]. Through the reduction of postoperative pain [2, 3], the danger of surgical site infection, and the risk of incisional hernia, laparoscopic cholecystectomy has revolutionised the surgical therapy of gallbladder (GB) problems. It is also noted that laparoscopic cholecystectomy has an advantage over open cholecystectomy owing to the fact that it requires less time spent in the hospital, allows for an earlier return to work, and is less expensive [4]. Pain is the most common complaint that patients have after undergoing laparoscopic cholecystectomy, and it is also the primary cause for more prolonged hospital stays [5]. There are a number of factors that can cause pain following a laparoscopic cholecystectomy. These factors include the rupture of blood vessels that occurs as a result of rapid distension of the peritoneum, traumatic traction on the nerves, trauma to the abdominal wall during port insertion and GB retrieval, and pneumoperitoneum that is caused by the use of carbon dioxide to maintain high abdominal pressure [6]. During the first forty-eight hours after a laparoscopic cholecystectomy, it has been observed that incisional pain is more severe than visceral pain and that it is the predominant component of pain [7]. An additional point to consider is that the way in which different people react to various pain-relieving treatments varies from person to person. Numerous clinical studies have been conducted to investigate various approaches of alleviating pain after laparoscopic cholecystectomy.

It is stated that retrieval of GB is one of the variables that affects postoperative port site discomfort. This is because retrieval of GB is an essential terminal event of laparoscopic cholecystectomy. GB is typically collected via either the umbilical port or the epigastric port. Both of these ports have been suggested for the retrieval of GB during laparoscopic cholecystectomy [8-10], and the choice of which port to use is always determined by the surgeon's personal taste. In adult patients who are having elective laparoscopic cholecystectomy, the purpose of this research is to assess whether or not gall bladder (GB) retrieval via an umbilical port is related with a higher level of discomfort in comparison to GB retrieval from an epigastric port.

2. Materials and Methods

A comparative study conducted in SMS hospital in 60 patients, 30 patients in each group. Written and informed permission from all cholelithiasis patients obtained. Age range (15-80 years) for laparoscopic cholecystectomy and regardless of sex were included in study.

GB mucocele, empyema, acute cholecystitis, and suspected or confirmed GB cancer, long-term users of steroids and analgesic medications were excluded in the study.

The USG report is used to select patients with cholelithiasis. Patients who met the inclusion criteria were randomly assigned to one of two groups, GB retrieved from an umbilical port (Group A) or an epigastric port (Group B), using a computer randomization method. The SMS Medical College Ethics Review Committee gave their approval to the study. Prior to the operation, each participant gave their informed permission in a language that the patient could understand.

A proforma was used to capture the sociodemographic, clinical, and outcome characteristics. A consultant general surgeon used the four port approach while operating under general anaesthesia. The epigastric and umbilical areas received 10 mm ports. A Verses needle was used to establish the pneumoperitoneum prior to the placement of the umbilical port. Following the dissection, GB was removed by an epigastric or umbilical port and placed in a plastic bag. When GB was retracted via an umbilical port, the telescope was moved to the epigastric port to make it easier to recover GB through the umbilical port. If the epigastric port was utilised, it was dilated using a metal dilator (artery forceps).

When the GB was being retrieved, it was opened if it was discovered to be enlarged or to contain a big stone. Bile was then suctioned, and if necessary, the stone was removed under a microscope. If GB could not be recovered, the metallic dilatation was covered by the incision. Vicryl was used to sew the umbilical wound's facial sheath, and Ethilon 2.0 RC sutures were used to sew the skin. The surgical surgeon used a VAS scale (0-10) to measure the difficulty of GB retrieval (0 being very easy retrieval and 10 being extremely difficult retrieval). In both groups, post-operative analgesia followed a conventional protocol. Patients who are receiving conventional analgesia but still have substantial pain with a VAS of 4 or above are prescribed rescue analgesia. Postoperative port site pain was measured using the Visual Analogue Scale (VAS), which has a range of 0 to 10. Prior to surgery, patients received education about the use of VAS. Every patient had their pain evaluated at both port sites at 1, 6, 12, 24, and 36 hours after surgery by a qualified nurse who was blind to the intervention. Following their release, the patients were monitored in surgery OPD on the fifth postoperative day, and any problems following the procedure were noted.

3. Results

A total of sixty patients diagnosed with cholelithiasis based on ultrasonographic and intra-operative findings underwent cholecystectomy. Group A consisted of two men (6.6%) and twenty-eight women (93.3%), with a mean age of 39. Group B consisted of five men (16.6%) and twenty-five women (83.3%), with a mean age of 47. These patients were included in the study.

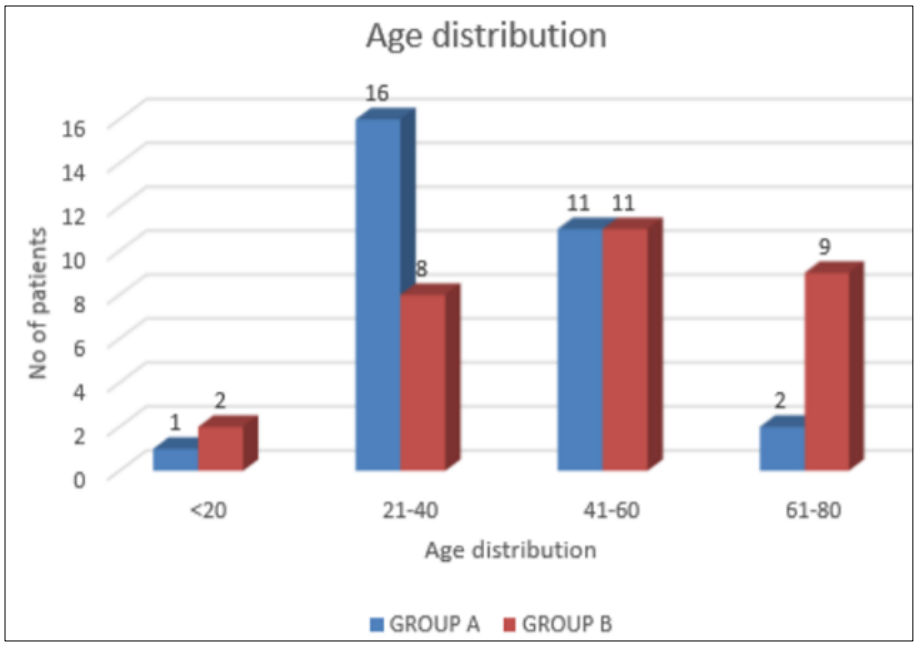

Fig 1: Age distribution between groups

Duration of surgery in group A was 61.56±5.43 mins and in group B was 55.53±8.87 mins. Difficulty in GB retrieval in Group A was 5.5±1.19, in Group B was 4.6±0.758.Which was statistically significant.

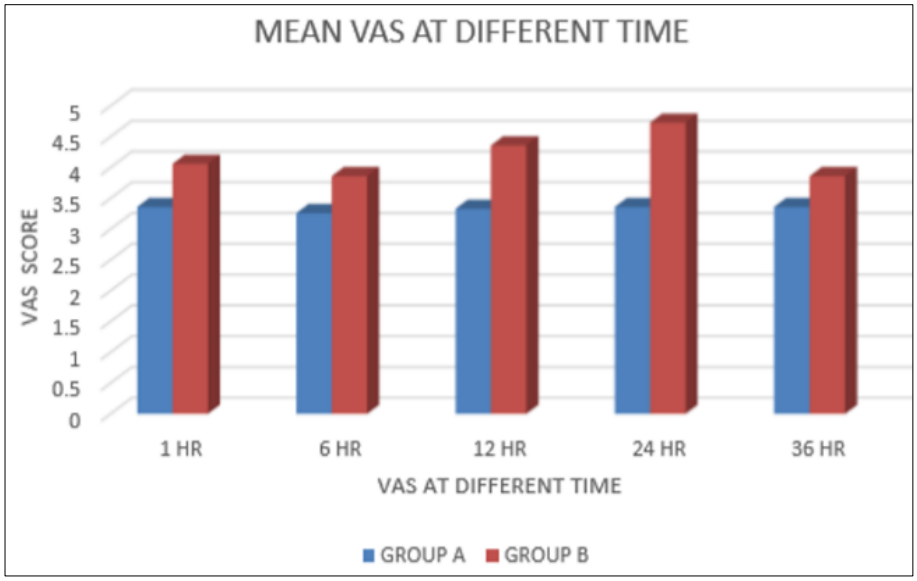

Fig 2: VAS score at different times

VAS score in 1hour, 6th hour, 12th hour and 24th hour was significantly less in Group A compared with group B.

4. Discussion

This research comprised a total of sixty patients who had cholecystectomy. In Group A, there were two males (6.6%) and twenty-eight women (93.3%). In Group B, there were five men (16.6%) and twenty-five women (83.3%). The mean age of patients in Group A was 39, while in Group B it was 47. It is similar to the series conducted by Shakya *et al*. [11] with a 75% female participation rate, Siddiqui *et al*. [12] with a 76% female participation rate, Bashir *et al*. with a 56% female participation rate, and Ahmed *et al*. with a 60% female participation rate.

In group A, the average age was 39 with a standard deviation of 13.9, whereas in group B, the average age was 47.2 with a standard deviation of 18. The findings are similar to those reported by Siddique *et al*. [12] (47.69±9.4 Vs. 40.6±12.6) and Bashir *et al*. [13] (47.49±9.4 Vs. 48.84±5.60).

The postoperative Visual Analogue Scale (VAS) score for pain was evaluated at the port locations in both groups. In group A, the average pain score at the umbilical port is consistently greater than at the epigastric port. In contrast, in group B, the VAS score is higher at the epigastric port compared to the umbilical port. It was determined that the pain score is consistently greater at the port location where the gallbladder was removed, regardless of whether it was taken out by the epigastric port or the umbilical port.

Comparing the Visual Analogue Scale (VAS) of the umbilical port in Group A with the VAS of the epigastric port in Group B, it was seen that the pain was consistently greater in the epigastric port of Group B. This difference was statistically significant at 1 hour, 6 hours, 12 hours, and 24 hours after the operation. Siddique *et al*. [12] and Shakya *et al*. [11] reported similar findings, concluding that the umbilical port was more effective for gallbladder removal in relation to postoperative discomfort.

In contrast to the current research, Bashir *et al*. [13] and Ahmed *et al*. [14] suggested that both the umbilical and epigastric ports are equally beneficial for gallbladder extraction in terms of postoperative discomfort and that the choice between the two ports depends on the surgeon's preference. Abbas *et al*. [15] favoured using the epigastric port for gallbladder removal because it is convenient for the general surgeon, eliminating the need to reposition the telescope or alter the surgeon's posture.

Singh *et al*. [16] found that individuals who had their gallbladder removed using an endo-bag had reduced discomfort at the incision sites compared to those who did not use an endo-bag (4% vs. 8%). In our research, the gallbladder (GB) was removed and placed in an endo-bag in all patients. However, patients in the epigastric group had higher discomfort at the incision sites compared to those in the umbilical group.

The time of operation was significantly longer in group A (61.56±5.43) compared to group B (55.53±8.87), with a statistically significant difference (P value = 0.0024). The results of this study were similar to the findings of Ranendra *et al*. [17], who examined the time it took to retrieve the gallbladder in two groups. The retrieval time was greater in the umbilical port group, with a mean duration of 4.94±1.56 compared to 3.24±1.29 in the other group.

In our research, we evaluated the difficulty of retrieving the gallbladder in both groups. The average difficulty level at the umbilical port (group A: 5.5±1.19) was greater compared to the epigastric port (group B: 4.6±0.758), and this difference is statistically significant (P value = 0.0009). The findings were similar to those reported by Siddique *et al*. [11] (4.4±1.2 Vs.4.2±1.1) and Ranendra *et al*. [17] (4.49±1.56 Vs.3.24±1.29).

Among the sixty patients included in the research, only three individuals had postoperative complications, including surgical site infection (SSI) and port site sinus. Regardless of whether the gallbladder was removed via the umbilical port or the epigastric port, these individuals had a surgical site infection (SSI) at the gallbladder retrieval port site. Group A consisted of one patient, whereas Group B consisted of two individuals. The results did not show statistical significance.

5. Conclusion

According to this research, the umbilical port is less painful following laparoscopic cholecystectomy than the epigastric port, although it also requires a little more time to retrieve the GB.

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