



Original article

## ADVANTAGES OF LAPAROSCOPIC SURGERY IN CALCULOUS CHOLECYSTITIS

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### SUMMARY

**Purpose:** The aim of the study is the comparative analysis of the operating time, blood loss during surgery, postoperative discomfort, and pain, hospital stay, cost-effectiveness, and patient satisfaction in patients undergoing laparoscopic cholecystectomy and conventional cholecystectomy in UMHATEM “N. I. Pirogov”.

**Material and Methods:** For a one-year period (from 01.01.2018 to 01.01.2019) 512 patients with calculous cholecystitis were operated on the Department of General, Visceral, and Emergency surgery on UMHATEM “Pirogov”. In 487 of these cases, laparoscopic cholecystectomy was performed (group I), the remaining 25 cases were treated with conventional cholecystectomy (group II). Women with laparoscopic cholecystectomy (group I) were 392 (75.82%), men 95 (24.18%). From the open surgery cohort (group II), women were 19 (75.41%), men 6 (24.59%). The age in this retrospective analysis varied from 18 to 83 years (average 52.7 years).

**Results:** From group I (lap. cholecystectomy), women were 392 (80.49%), men 95 (19.51%). In group II (open cholecystectomy), women were 19 (76%), men 6 (24%). Age in this retrospective analysis ranged from 18 to 83 years (average 52.7 years) for both groups. There was no significant difference between demographic variables in the two groups. The operating time varied between 23 and 165 min (average 39.4 min) for group I and 35 to 104min (average 44.6min) for group II respectively. The hospital stay was recorded from 48 hours to 7 days (2.7 days on average) for group I and 3 to 9 days (average 4.5 days) for group II respectively. Surgical morbidity included 12 patients (operative wound suppuration, ileus, postoperative hernia, jaundice), 7 from group I (1.44%) and 5 from group II (20%), which was considered a significant difference.

**Conclusion:** Laparoscopic cholecystectomy is an easy intervention, reduced time-consuming procedure, with shortened complication rates compared to open cholecystectomy. It completely debates an advantage of a decreased hospital stay and early return to work compared to open surgery

**Keywords:** cholecystitis, laparoscopy, cholecystectomy, approach, advantages,

### INTRODUCTION

The prevalence of gallstone disease among the population has increased in recent decades.

The gold standard in the treatment of this illness for about 3 decades ago was conventional cholecystectomy. In line with international research, the nowadays current approach to treatment is laparoscopic cholecystectomy. Thus reducing postoperative pain, analgesia costs, hospital stay, and total costs, and not least quick recovery to normal activities and work [1].

Despite these advantages, there are certain obstacles in laparoscopy. Three-dimensional deep perception is limited in most two-dimensional monocular imaging devices. In this way is more difficult to control significant hemorrhage in the operating table [2]. It is trickier to comprehend anatomical structures with laparoscopic instruments than direct digital palpation in conventional cholecystectomy [3]. Some literature sources indicate that the technological preparation and performance of laparoscopy takes longer than open surgery [4]. Laparoscopy is contraindicated in some cardiac patients, because insufflation with CO<sub>2</sub> may cause arrhythmia [5]. The most disturbing complication of laparoscopic cholecystectomy is the leakage of bile in the iatrogenic lesion of the bile duct.

Successful laparoscopies are straightly associated with the experience and learning curve of surgeons. The laparoscopic approach stands in need of more expensive instruments than conventional surgery, along with precise knowledge and experience [6]. Therefore, in some less developed healthcare systems, open surgery is the preferred method.

Infective complications of open cholecystectomy are well recognized, and prophylactic antibiotics are regular therapy. Operative wounds after open cholecystectomy are completely different compared to laparoscopic cholecystectomy. Wounds after mini-invasive interventions are smaller in comparison with open surgery. Furthermore, the immune system is better protected in laparoscopic surgery because of reduced tissue trauma. This results in lesser activation of the inflammatory response following laparoscopic surgery. Another feature is that laparoscopic cholecystectomy does not violate the mucosal defense barrier of the respiratory, gastrointestinal, or genital epithelium. Low incidence of infections following laparoscopic cholecystectomy made the need for frequent

antibiotic use debatable.

This study compares the advantages and disadvantages of both methods and analyzed the choice for an accurate surgical approach in calculous cholecystitis.

The aim of the study is the comparative analysis of the operating time, blood loss during surgery, postoperative discomfort, and pain, hospital stay, cost-effectiveness, and patient satisfaction in patients undergoing laparoscopic cholecystectomy and conventional cholecystectomy in UMHATEM “N.I.Pirogov”.

### MATERIAL AND METHODS

For a one-year period (from 01.01.2018 to 01.01.2018) 512 patients with calculous cholecystitis were operated on the Department of General, Visceral, and Emergency surgery on UMHATEM “Pirogov”. In 487 of these cases, laparoscopic cholecystectomy was performed (group I), the remaining 25 cases were treated with conventional cholecystectomy (group II).

**Table 1.** Mode of surgery

|  |              |
|--|--------------|
| Mode of surgery                          | 512 (100%)   |
| laparoscopic cholecystectomy (group I)   | 487 (95.12%) |
| conventional cholecystectomy (group II). | 25 (4.88%)   |

Women with laparoscopic cholecystectomy (group I) were 392 (75.82%), men 95 (24.18%).

**Table 2.** Gender distribution of laparoscopic cholecystectomy (group I)

|   |              |
|---|--------------|
| Gender distribution of laparoscopic cholecystectomy (group I) | 487 (100%)   |
| women   | 392 (80.49%) |
| men   | 95 (19.51%)  |

From the open surgery cohort (group II), women were 19 (75.41%), men 6 (24.59%).

**Table 3.** Gender distribution of conventional cholecystectomy (group II)

|  |           |
|--|-----------|
| Gender distribution of conventional cholecystectomy (group II) | 25 (100%) |
| women  | 19 (76%)  |
| men  | 6 (24%)   |

Parameters recorded in this study were age, gender, clinical symptoms, mode of treatment, morbidity, and mortality rate.

The age in this retrospective analysis varied from 18 to 83 years (average 52.7 years).

Patients under 18 and those with choledocholithiasis, portal hypertension, cirrhosis, and coagulopathy were excluded from the study.

Gallbladder disease was identified by anamnesis, physical examination, laboratory data, CT, and ultrasound.

Pathological diagnosis was verified by micro- and macroscopic examination of the gallbladder.

Indication for surgery was most often acute calculous cholecystitis.

Data from all of the cases admitted to the hospital with calculous cholecystitis was carefully systematized, analysed, and summarized.

The results were compiled by monitoring the morbidity for up to one-month post-discharge.

### RESULTS

From group I (lap. cholecystectomy), women were 392 (80.49%), men 95 (19.51%). In group II (open cholecystectomy), women were 19 (76%), men 6 (24%).

Age in this retrospective analysis ranged from 18 to 83 years (average 52.7 years) for both groups. There was no significant difference between demographic variables in the two groups.

The operating time varied between 23 and 165 min (average 39.4 min) for group I and 35 to 104min (average 44.6min) for group II respectively.

**Table 4.** Operating time

|  |                    |
|--|--------------------|
| Operating time                           |                    |
| laparoscopic cholecystectomy (group I)   | 23-165m (39.4 av.) |
| conventional cholecystectomy (group II). | 35-105m (44.6 av.) |

The hospital stay was recorded from 48 hours to 7 days (2.7 days on average) for group I and 3 to 9 days (average 4.5 days) for group II respectively.

**Table 5.** Hospital stay

|  |                    |
|--|--------------------|
| Hospital stay                            |                    |
| laparoscopic cholecystectomy (group I)   | 2-7 d (2.7 d. av.) |
| conventional cholecystectomy (group II). | 3-9 d (4.5 d. av.) |

Most relevant clinical symptoms in both groups were abdominal pain and discomfort as well as nausea and vomiting.

There were significant differences in the postoperative period. Postoperative pain and fatigue in the group I were of much lower intensity, regaining strength and recovery performance at an earlier stage.

Surgical morbidity included 12 patients (operative wound suppuration, ileus, postoperative hernia, jaundice), 7 from group I (1.44%) and 5 from group II (20%), which was considered a significant difference.

**Table 6.** Surgical morbidity

|   |            |
|---|------------|
| Surgical morbidity                          | 12 (2.34%) |
| laparoscopic cholecystectomy<br>(group I)   | 7 (1.44%)  |
| conventional cholecystectomy<br>(group II). | 5 (20%)    |

A lethal outcome occurred in 1 patient from group II (0.2%). The main causes were complicated comorbidity as well as sepsis.

## DISCUSSION

The study was prevailed by patients in their fourth decade, the larger part of whom were women. There was no important inequality between demographic variables in the two groups.

Surgical time varied between 23 and 165min (average 39.4min) for group I and by 35 to 105 min (average 44.6 min) for group II respectively which was comparable to the literature data.

In most patients from group I blood loss was minimal (<100ml), while increased blood loss (>100ml) was more common in group II. This is a conclusion characterized by laparoscopic surgery, quoted by other surgeons.

According to our data, from analyzing both groups, postoperative pain was reported less in patients with laparoscopic surgery compared to open surgery. Laparoscopic surgery, which is a mini-invasive intervention, affects a restricted tissue area, which follows in reduced soreness. This is cited by most of the international

research. In a research by Doke, Gadekar et al. the analgesics used were found to be bigger in open cholecystectomy [7].

The hospital stay was recorded from 48 hours to 7 days (2.7 days on average) for group I and 3 to 9 days (average 4.5 days) for group II respectively. This was a statistically significant magnitude. A shorter hospital stay prevails a dominant advantage of laparoscopic cholecystectomy.

Postoperative morbidity, mostly expressed as wound infection or abdominal swelling is significantly higher in open cholecystectomy (group II). This is comparable to other studies, such as Coccolini et al.

Early recovery of normal activities is also a basic feature in laparoscopic surgery, as described in Antoniou, Koch et al., and Saeed, Zarin et al.

Reduced cost is also an advantage of laparoscopic interventions. This is primarily direct to the difference in the structure of indirect cost. These include hospital bed rate, period of disability, hospital staff cost, and post-operative medication [8].

The level of satisfaction was significantly higher in the laparoscopic cholecystectomy group. This is due to a reduced hospital stay, lower incidence of complications and postoperative pain, as well as an early recovery of normal activities [9].

The results of our research showed that laparoscopic cholecystectomy is a more effective and satisfactory procedure that shortens hospital stay and ensures an early return to work. Careful selection of every case for mini-invasive surgery is required.

## CONCLUSION

Laparoscopic cholecystectomy is an easy intervention, reduced time-consuming procedure, with shortened complication rates compared to open cholecystectomy. It completely debates an advantage of a decreased hospital stay and early return to work compared to open surgery.

Accordingly, laparoscopic cholecystectomy as a surgical procedure can be recommended over open cholecystectomy operation in carefully selected patients with gall stone disease.

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