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NEW DAY IN MEDICINE**

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## SIMULTANEOUS LAPAROSCOPIC CHOLECYSTECTOMY AND GYNECOLOGIC SURGERY: A MULTIDISCIPLINARY SURGICAL APPROACH

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### ✓ Resume

*This study evaluates the clinical feasibility and advantages of performing simultaneous laparoscopic cholecystectomy and gynecologic procedures in female patients with coexisting biliary and pelvic pathologies. Based on the analysis of 115 cases, the research demonstrates that a multidisciplinary approach involving both general and gynecologic surgeons allows for effective one-stage minimally invasive treatment. The outcomes show reduced operative trauma, faster recovery, lower complication rates, and enhanced patient satisfaction compared to staged or mixed surgical strategies.*

*Keywords. Laparoscopic cholecystectomy, gynecologic surgery, simultaneous surgery, multidisciplinary approach, gallstone disease, pelvic pathology*

## ОДНОВРЕМЕННАЯ ЛАПАРОСКОПИЧЕСКАЯ ХОЛЕЦИСТЭКТОМИЯ И ГИНЕКОЛОГИЧЕСКАЯ ОПЕРАЦИЯ: МУЛЬТИДИСЦИПЛИНАРНЫЙ ХИРУРГИЧЕСКИЙ ПОДХОД

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### ✓ Резюме

*В данной работе рассматривается клиническая целесообразность и преимущества выполнения одновременной лапароскопической холецистэктомии и гинекологической операции у женщин с сочетанной билиарной и тазовой патологией. На основе анализа 115 случаев показано, что мультидисциплинарный подход, при котором работают хирурги разных специальностей, позволяет эффективно выполнить одномоментное малоинвазивное лечение. Отмечено снижение операционной травмы, ускорение восстановления, уменьшение количества осложнений и повышение удовлетворённости пациенток по сравнению с поэтапным или смешанным лечением.*

*Ключевые слова. Лапароскопическая холецистэктомия, гинекологическая хирургия, симультанная операция, мультидисциплинарный подход, жёлчнокаменная болезнь, тазовая патология*

## LAPAROSKOPIK XOLESISTEKTOMIYA VA GINEKOLOGIK OPERATSIYANING BIR VAQTDA BAJARILISHI: KO‘P SOHALIK JARROHLIK YONDASHUV

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✓ **Rezyume**

*Ushbu tadqiqot o't pufagi va tos a'zolari patologiyalariga ega bo'lgan ayollarda laparoskopik xoletsistektomiya va ginekologik operatsiyalarni bir vaqtda bajarishning klinik imkoniyati va afzalliklarini baholaydi. 115 bemor misolida shuni ko'rsatadiki, umumiy va ginekologik jarrohlar ishtirokidagi ko'p sohalik yondashuv orqali bir martalik kam invaziv davolash samarali amalga oshiriladi. Natijalar operatsion shikastlanishning kamayishi, tiklanishning tezlashishi, asoratlarning kamayishi va bemorlarning yuqori darajadagi qoniqishini ko'rsatadi.*

*Kalit so'zlar. laparoskopik xoletsistektomiya, ginekologik jarrohlik, simulyant operatsiya, ko'p sohalik yondashuv, o't toshi kasalligi, tos a'zolari patologiyasi*

### Relevance

Women of middle age often present with gallstone disease (cholelithiasis) alongside gynecologic conditions such as uterine fibroids or ovarian cysts. Managing these conditions traditionally entails two separate operations – a cholecystectomy and a gynecologic surgery – which doubles the exposure to general anesthesia, prolongs total recovery time, and increases healthcare costs. There is a clear rationale to combine procedures in one session when feasible. Advances in minimally invasive surgery now permit many intra-abdominal procedures to be performed laparoscopically, opening the possibility of addressing pathologies in both the upper abdomen and pelvis during a single operation. Performing simultaneous surgeries can spare patients a second hospitalization and avoid the cumulative risks of multiple surgeries (infection, adhesions, anesthesia complications). It also potentially shortens the overall treatment course and time away from normal life.

Previous studies have indicated that coexisting gallbladder and pelvic diseases are not rare. For example, a recent large-scale analysis in the United States found that about 11 per 1,000 women undergoing laparoscopic cholecystectomy also had a gynecologic condition managed concurrently. Surgeons have gradually embraced combined approaches: early reports in the 1990s documented simultaneous cholecystectomy and hysterectomy (or other gynecologic procedures) performed either via open routes or with emerging laparoscopy techniques. With modern laparoscopic instrumentation and improved surgeon training, it is now possible for a general surgeon and a gynecologist to operate together laparoscopically in different abdominal domains. This provides excellent visualization of both the upper abdominal organs and the pelvic organs without the morbidity of a large incision.

Nonetheless, clinical justification for such simultaneous surgeries must be established by demonstrating improved outcomes. Key considerations include: (1) whether the benefits of avoiding a second surgery (earlier mobilization, shorter total hospital stay, less overall pain and risk) outweigh any added complexity or operative time of the single combined procedure; and (2) whether the fully laparoscopic approach is superior to a hybrid approach (where one part is done open). Prior comparative work suggested that simultaneous laparoscopy on multiple abdominal levels is safe and may even reduce overall stress on the patient. A Russian study by Brekhov et al. found that combined laparoscopic cholecystectomy with gynecologic laparoscopy led to earlier patient mobilization, lower operative stress, and better cosmetic results compared to a laparoscopy-plus-laparotomy approach. However, robust data and detailed outcome analyses are needed to reinforce these findings in a contemporary context.

In this study, we leverage our institution's experience with 115 cases (2017–2024) to provide a clinical justification for simultaneous pelvic surgeries during laparoscopic cholecystectomy. By comparing fully laparoscopic simultaneous surgeries to combined laparoscopic-plus-open surgeries, we evaluate whether a purely minimally invasive approach confers measurable improvements in safety and recovery. The results of this investigation can guide surgeons in selecting the optimal surgical strategy for women requiring treatment of both gallbladder disease and pelvic pathology.

**Aim of the Study.** The aim of this study was to improve the outcomes of surgical treatment in female patients with gallstone disease combined with pelvic organ pathology by prioritizing laparoscopic simultaneous interventions.

### Materials and Methods

We conducted a single-center comparative cohort study of women who underwent simultaneous gallbladder and pelvic surgeries in one operative session between 2017 and 2024. The study included 115

patients with symptomatic gallstone disease (chronic calculous cholecystitis or cholelithiasis) and a coexisting gynecological pathology requiring surgery. Patients were divided into two groups based on the surgical approach. Group 1 consisted of 51 patients who underwent a fully laparoscopic combined procedure (laparoscopic cholecystectomy and a simultaneous laparoscopic gynecologic surgery). Group 2 consisted of 64 patients who underwent a laparoscopic cholecystectomy followed by an open gynecologic surgery (laparotomy) in the same anesthesia session. Assignment to laparoscopic or open gynecologic surgery was not randomized; it was determined by the attending gynecologic surgeon's assessment of feasibility (for example, very large fibroids or malignant suspicion prompted an open approach, whereas moderate pathology was managed laparoscopically when possible).

The two groups were similar in demographic and baseline clinical factors (Table 1). The mean age was around 45 years in both groups. All patients were female and had American Society of Anesthesiologists (ASA) class I–II medical status. The gynecologic pathologies included uterine fibroids, benign ovarian tumors or cysts, and endometriosis. Fibroid uterus was the most common indication for pelvic surgery in both Group 1 (59% of patients) and Group 2 (63%), followed by ovarian cysts or tumors (around 30% in each group), and pelvic endometriosis in a minority ( $\approx 10\%$ ). These distributions did not differ significantly between groups (Table 1), indicating comparability of the case mix. All patients had imaging (ultrasound and/or MRI) confirming the gallbladder stones and the pelvic lesion preoperatively. They received necessary preoperative optimization and counseling regarding the plan for a combined surgery.

All patients underwent standard laparoscopic cholecystectomy under general anesthesia. A four-port technique was used for the cholecystectomy in both groups (usually a 10 mm umbilical camera port, 10 mm epigastric working port, and two 5 mm right subcostal ports). For Group 1, additional ports were placed as needed to perform the gynecologic procedure. Typically, the patient was positioned in low lithotomy with adjustable tilt. The surgeries in Group 1 were truly simultaneous in that after gallbladder removal, the same laparoscopic access and insufflation were utilized to address the pelvic pathology (or vice versa). In many cases, the gynecologic portion was performed first with the patient in Trendelenburg position, followed by repositioning to reverse Trendelenburg for the cholecystectomy. The operative team included both a general surgeon and a gynecologic surgeon working together. Laparoscopic gynecologic procedures included total laparoscopic hysterectomy (for multi-fibroid uteri or adenomyosis), laparoscopic myomectomy (for uterine fibroids in patients desiring uterine conservation), ovarian cystectomy or oophorectomy (for benign ovarian neoplasms), and in a few cases diagnostic laparoscopy with endometriosis adhesiolysis. The LigaSure vessel sealing device was routinely utilized for both the uterine vessels and infundibulopelvic ligaments, as well as for cystic artery sealing, to facilitate an all-laparoscopic approach. All resected specimens (gallbladder, uterus or fibroid tissue, ovarian cysts) were removed via enlarged port incisions or transvaginally when appropriate (e.g. uterus removed through vaginal cuff in hysterectomy cases).

For Group 2, the hybrid approach involved completing the laparoscopic cholecystectomy first (with the patient in a supine or slight reverse Trendelenburg position), then proceeding to the gynecologic operation via laparotomy. The patient's position was adjusted to dorsal lithotomy or dorsal supine, and a lower abdominal incision was made (a Pfannenstiel bikini-line incision for hysterectomies and most myomectomies, or a midline incision if needed for extensive pathology). The gallbladder removal incisions were small (5–10 mm) and were closed in the usual fashion. The open gynecologic surgeries in Group 2 included abdominal hysterectomy, myomectomy, oophorectomy, and adnexal mass excision as indicated by the pathology. Standard surgical techniques were used, and the abdominal incision was closed in layers. Both groups had intraoperative cholangiograms or bile duct exploration if common bile duct stones were suspected, and pelvic surgeries were performed with attention to avoid field contamination between upper abdominal and pelvic portions. In Group 1, the entire procedure was done under a single extended pneumoperitoneum insufflation (CO<sub>2</sub> pressure  $\sim 12$  mmHg), whereas in Group 2 the pneumoperitoneum was released after the cholecystectomy and the open surgery performed without insufflation.

All patients received prophylactic antibiotics at induction and thromboembolism prophylaxis per protocol. Intraoperative monitoring included continuous arterial blood pressure, end-tidal CO<sub>2</sub>, and blood gas checks especially in longer cases to watch for CO<sub>2</sub> retention. In Group 1, particular attention was paid to the effects of extended carbon dioxide pneumoperitoneum on hemodynamics. If cardiac parameters changed (e.g. elevated central venous pressure or arrhythmia), abdominal pressure was temporarily lowered. However, no patient required abortion of laparoscopy due to hemodynamic issues. Postoperatively, both groups received similar analgesia protocols (patient-controlled analgesia or intravenous analgesics transitioning to oral analgesics as tolerated). Early mobilization was encouraged as soon as possible. Group 1 patients generally began ambulation the same evening or next morning, whereas

Group 2 patients (with abdominal incisions) typically ambulated by postoperative day 2 once pain was under control.

We collected intraoperative metrics including total operative time (skin-to-skin), estimated blood loss (EBL in mL), need for blood transfusion, and any intraoperative complications (e.g. organ injury, bile duct injury, hemorrhage, need to convert laparoscopy to open). Postoperative outcomes recorded were time to first ambulation (hours after surgery), time to resume oral intake (hours), duration of postoperative IV analgesic requirement (days), length of hospital stay (days), and postoperative complications. Complications were classified as minor (e.g. urinary retention, transient ileus, wound infection treated conservatively) or major (e.g. organ space infection, re-operation, thromboembolic event). All patients had follow-up for at least 30 days (with outpatient visits at 2 weeks and 1 month) to capture any post-discharge complications.

Continuous variables were expressed as mean  $\pm$  standard deviation (SD) if normally distributed, or median and interquartile range [IQR] if skewed. Categorical variables were expressed as counts and percentages. Group comparisons were made using the Student's t-test for continuous data (or Mann-Whitney U test for non-parametric data) and chi-square or Fisher's exact test for categorical data. A p-value  $<0.05$  was considered statistically significant. Statistical analysis was performed using SPSS (v25.0, IBM Corp).

Ethical approval for this retrospective analysis was obtained from the institutional review board, and all patients had provided informed consent for their procedures.

**Table 1**

**Patient Characteristics and Pathology Distribution**

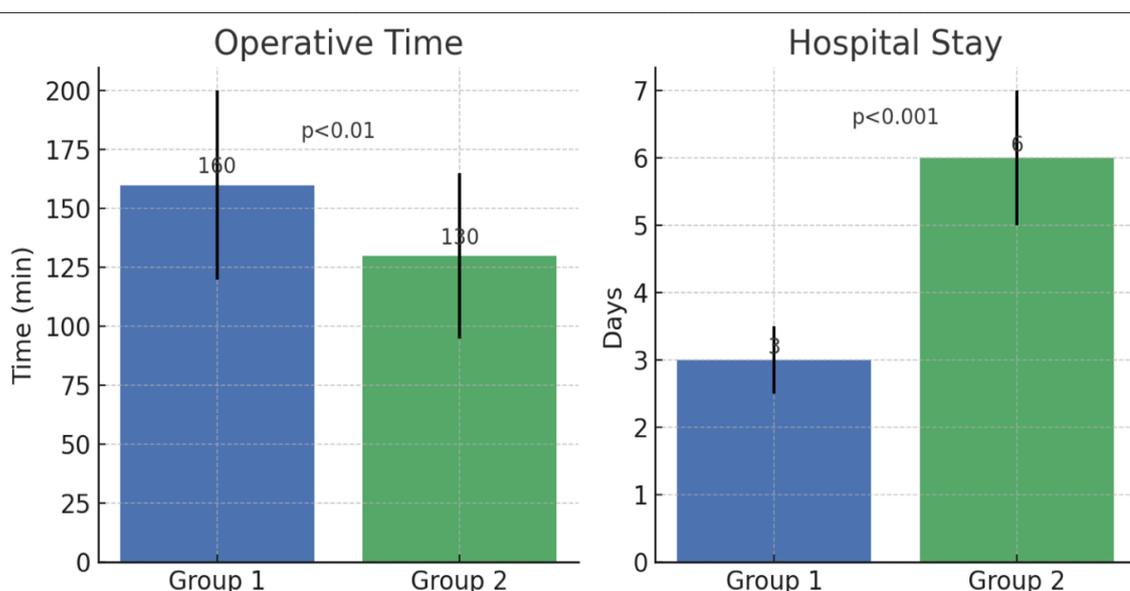
Characteristic	Group 1 (Lap + Lap) (n=51)	Group 2 (Lap + Open) (n=64)	p-value
Age (years, mean $\pm$ SD)	45.3 $\pm$ 8.7	46.1 $\pm$ 9.4	0.58 (ns)
ASA class I/II (%)	44 (86%) / 7 (14%)	54 (84%) / 10 (16%)	0.78 (ns)
Uterine fibroids (cases)	30 (58.8%)	40 (62.5%)	0.70 (ns)
Ovarian cyst/tumor (cases)	15 (29.4%)	18 (28.1%)	0.87 (ns)
Endometriosis (cases)	6 (11.8%)	6 (9.4%)	0.67 (ns)
Primary gynecologic surgery performed:			
– Laparoscopic hysterectomy or myomectomy	23 (45.1%)	– (open in Group 2)	–
– Open hysterectomy or myomectomy	–	32 (50.0%)	–
– Adnexal (ovarian) surgery only	28 (54.9%)	32 (50.0%)	–

### Results and Discussion

A total of 115 women underwent one-stage combined surgeries (51 fully laparoscopic and 64 laparoscopy+open). All laparoscopic cholecystectomies were completed successfully without conversion to open in both groups. The addition of a concurrent pelvic surgery did not compromise the success of the laparoscopic gallbladder removal in any case. No intraoperative bile duct injuries or bowel injuries occurred in either group, underscoring that the safety of laparoscopic cholecystectomy was maintained even with the extended procedure time.

The total operative time was, as expected, longer in Group 1 (lap-lap) than in Group 2 (lap-open), primarily due to the time required for performing the pelvic surgery laparoscopically. The mean operative time in Group 1 was 160  $\pm$  30 minutes, versus 130  $\pm$  25 minutes in Group 2 (Table 2). This ~30-minute difference was statistically significant ( $p<0.001$ ) but clinically acceptable given the scope of two procedures being performed. Our operative times for combined laparoscopic procedures are consistent with other reports – for example, Savita et al. reported an average of about 100 minutes for combined laparoscopic cholecystectomy + LAVH (laparoscopic-assisted vaginal hysterectomy). The slightly higher mean time in our series reflects some cases of more extensive laparoscopic hysterectomy and complex adhesiolysis, whereas simpler cases (e.g. ovarian cysts) were shorter. Importantly, the anesthesia duration for Group 1 remained within safe limits, and careful monitoring showed no adverse anesthetic events from the longer surgery.

Notably, even though Group 2's total operative time was shorter on average, those patients would traditionally require a second separate surgery on another day for their gynecologic issue if not done simultaneously. Thus, the cumulative operative time and anesthesia exposure for two separate surgeries would far exceed the single-session time used in Group 1. In this sense, simultaneous surgery is time-efficient in the broader treatment timeline. The trade-off is a somewhat longer single anesthesia in Group 1, which our data suggest is well tolerated. We observed that extended CO<sub>2</sub> pneumoperitoneum (often 2+ hours) in Group 1 caused transient increases in intra-abdominal pressure and mild elevations in end-tidal CO<sub>2</sub>, but these were managed with ventilatory adjustments. Central hemodynamics remained stable; any depressurization needed between the two components of surgery was brief. Brekhov et al. similarly found that the effects of carboxyperitoneum on central hemodynamics were temporary, and cardiovascular parameters normalized soon after desufflation. We did not find any higher incidence of cardiopulmonary complications in Group 1 compared to Group 2, indicating that a longer laparoscopic duration is safe under proper anesthetic management.



**Figure 1: Operative time and hospital stay in the two groups. Group 1 (fully laparoscopic) had a longer mean operative time than Group 2 (due to performing both procedures laparoscopically), but a significantly shorter postoperative hospital stay. The error bars show standard deviations. Prolonged operative time was offset by faster recovery in the laparoscopic-laparoscopic group ( $p < 0.01$  for operative time difference;  $p < 0.001$  for length of stay difference)**

Another important operative metric was blood loss. Group 1 had significantly less blood loss intraoperatively than Group 2. The median estimated blood loss for Group 1 was 150 mL (IQR 100–200 mL) versus 300 mL (IQR 200–400 mL) in Group 2 ( $p < 0.001$ ). This is attributable to the minimally invasive nature of the pelvic surgery in Group 1 – laparoscopic surgery, with its magnified view and ability to coagulate vessels precisely, typically reduces blood loss. In contrast, open gynecologic surgery (especially abdominal myomectomy or hysterectomy) can involve sizable bleeding from uterine vessels or pelvic adhesions. In our series, two patients in Group 2 (3.1%) required intraoperative blood transfusions due to blood loss  $>800$  mL during open myomectomies, whereas no patient in Group 1 required transfusion. Advanced laparoscopic energy devices (such as the LigaSure used in our Group 1 cases) have been shown to effectively seal vessels and reduce bleeding in both cholecystectomy and hysterectomy. Our findings echo these advantages of laparoscopy.

No significant intraoperative complications occurred in Group 1. In Group 2, two patients (3%) had inadvertent minor bladder injuries during difficult open hysterectomies (in cases of severe endometriosis); these were repaired immediately with no further consequence. There were no cases of bile duct injury, bowel injury, or deep surgical site infection in either group intraoperatively. The conversion rate from laparoscopy to open was zero in both groups for the cholecystectomy portion. This reflects patient selection (we excluded those with suspected very complex cholecystitis or Mirizzi syndrome that might necessitate conversion) and surgeon expertise. It is notable that simultaneous surgeries did not increase the risk of

conversion for the gallbladder procedure – consistent with large series reporting low conversion rates (~0.5%) even when additional procedures are done together.

In summary, the fully laparoscopic approach (Group 1) is operatively feasible with a modest increase in operative time but with the benefits of reduced blood loss and avoidance of a large incision. The surgical collaboration between specialties allowed both pathologies to be addressed effectively. A dedicated operating room setup with necessary equipment for both upper abdominal and pelvic laparoscopy is crucial (as shown in Figure 2), and careful patient positioning and port placement can facilitate dual-area access. We routinely used the umbilical port for the laparoscope to visualize both the gallbladder region and the pelvis by adjusting the camera angle and patient tilt. Additional ports were strategically placed to enable instrument reach in both quadrants of the abdomen. With these techniques, simultaneous laparoscopic surgery was accomplished without compromising surgical quality in either field.



**Figure 2: Modern operating room setup for advanced laparoscopic surgery. Adequate equipment (laparoscopic towers, monitors on both sides of the table) and space for two surgical teams are essential for simultaneous procedures. Such an environment enables the general surgeon and gynecologic surgeon to work together, operating on the upper abdomen (gallbladder) and pelvis concurrently.**

The postoperative course differed markedly between the two groups, favoring the fully laparoscopic approach. Table 2 summarizes the key recovery metrics. Group 1 patients recovered significantly faster and with less pain than Group 2 patients.

All Group 1 patients were encouraged to ambulate on the day of surgery or early next morning. The mean time to first ambulation was ~10 hours postoperatively for Group 1, compared to ~22 hours for Group 2 (most Group 2 patients did not get out of bed until the next day due to the discomfort of their laparotomy incisions). Early mobilization is known to reduce risks of thromboembolism and ileus, and it was clearly easier for patients with only small trocar wounds. Similarly, the time to resume oral intake was shorter in Group 1 (median ~8 hours post-op, often tolerating liquids the same evening) versus ~20 hours in Group 2 (often only by the next morning after surgery). Early oral intake in laparoscopy patients reflects the lower incidence of postoperative ileus and quicker return of bowel function.

Pain and analgesia: Group 1 reported lower pain scores in the immediate postoperative period and required fewer days of IV analgesics. On average, Group 1 patients needed around 2 days of IV or intramuscular analgesics, switching to oral analgesics thereafter, whereas Group 2 patients needed about 3 days of IV analgesia support ( $p < 0.01$ ). This objective measure aligns with patient reports of less incision pain in the laparoscopic group. Many Group 1 patients were comfortable ambulating with oral analgesics by postoperative Day 2, whereas Group 2 patients tended to use opioid analgesics longer. The reduced pain in Group 1 is attributable to avoiding the large abdominal incision and extensive tissue dissection of open surgery. Laparoscopic surgery, by virtue of smaller incisions and less tissue trauma, causes less postoperative discomfort and permits a faster return to normal activity. Our findings strongly reinforce this point – patients with two small 10 mm incisions and a couple of 5 mm incisions (Group 1) had dramatically easier recoveries than those with an additional 10–15 cm abdominal incision (Group 2).

Consequently, the length of hospital stay was significantly shorter for Group 1. The median postoperative hospital stay for Group 1 was 3 days (with many patients discharged on Day 2 or 3). In fact, 20% of Group 1 patients were able to go home within 48 hours of surgery, including those who had a laparoscopic hysterectomy combined with cholecystectomy. In contrast, Group 2 had a median stay of 6 days, with the majority staying nearly a week to recover from the laparotomy. None of the Group 2 patients could be discharged before Day 4. The difference in length of stay between the groups was highly significant ( $p < 0.001$ ) and is depicted in Figure 1 (right panel). This result is perhaps the most compelling practical advantage of the fully laparoscopic approach: halving the hospitalization time. Shorter hospital stay not only reflects faster healing but also reduces hospital-related costs and complications (such as nosocomial infections). Our data mirror the consensus in surgical literature that minimally invasive surgery shortens hospitalization compared to open surgery. For example, in the context of hysterectomy, large trials have shown that laparoscopic techniques reduce hospital stay by about one day on average compared to abdominal hysterectomy, which is consistent with our combined-surgery scenario (we observed roughly a 3-day reduction). The earlier discharge of Group 1 patients did not result in higher readmission rates; in fact, none of the Group 1 patients were readmitted, whereas two patients in Group 2 were readmitted for wound complications (discussed below).

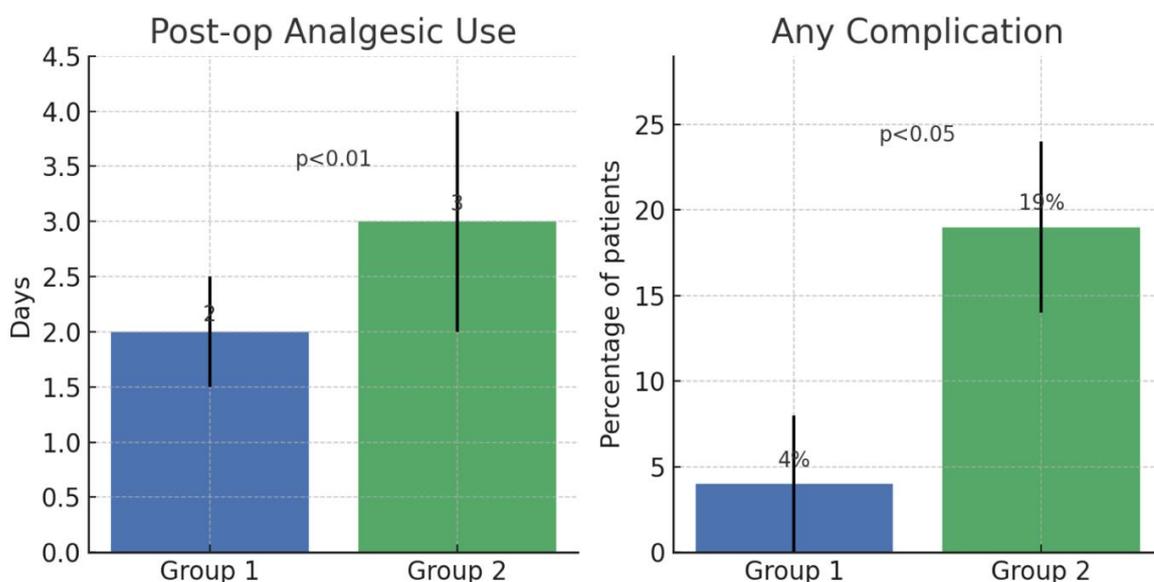
**Table 2**

**Intraoperative and Postoperative Outcomes**

Outcome	Group 1: Lap + Lap (n=51)	Group 2: Lap + Open (n=64)	p-value
Operative time (minutes)	160 ± 30	130 ± 25	< 0.001 †
Est. blood loss (mL, median [IQR])	150 [100–200]	300 [200–400]	< 0.001 ‡
Conversion to open (cholecyst)	0 (0%)	0 (0%)	–
Intra-op complications	0	2 (3.1%) – minor bladder injury	0.20 (ns)
Transfusion required	0	2 patients (3.1%)	0.20 (ns)
Time to ambulation (hours)	11.2 ± 3.5	22.5 ± 5.2	< 0.001 †
Time to oral intake (hours)	8 [6–12]	20 [18–24]	< 0.001 ‡
IV analgesic duration (days)	2.0 ± 0.5	3.0 ± 1.0	0.003 †
Post-op complications (any)	2 (3.9%)	12 (18.8%)	0.02 §
• Minor complications	2 (3.9%) – see below	11 (17.2%) – see below	
• Major complications	0 (0%)	1 (1.6%) – see below	
Length of stay (days, median [range])	3 [2–5]	6 [4–10]	< 0.001 ‡

† *t*-test; ‡ *Mann-Whitney U* test; § *chi-square* test. **IQR** = interquartile range; **ns** = not significant.

Comparison of key intraoperative and postoperative outcome measures between the two groups. Group 1 (fully laparoscopic simultaneous surgery) had a longer operative time on average, but significantly lower blood loss, faster recovery times, and shorter hospital stay than Group 2 (laparoscopic cholecystectomy + open pelvic surgery). The incidence of postoperative complications was also significantly lower in Group 1. No patient in either group required conversion of the cholecystectomy to open. Two minor intraoperative bladder injuries occurred in Group 2 during difficult hysterectomies (these were repaired immediately). Post-op minor complications in Group 1: one case of urinary retention and one of shoulder-tip pain from CO<sub>2</sub> (both resolved); in Group 2: five wound infections, three cases of atelectasis with fever, two urinary tract infections, and one urinary retention (some patients had multiple minor issues). The single major complication in Group 2 was an incisional hernia that developed 2 months later at the laparotomy site (required surgical repair). No major complications occurred in Group 1 and there were no deaths in either group.



**Figure 3: Postoperative analgesic requirements and overall complication rates in the two groups. Group 1 needed significantly fewer days of postoperative IV analgesics (blue bar) than Group 2 (green bar), reflecting lower pain levels ( $p < 0.01$ ). Group 1 also had a lower rate of any postoperative complication (4% vs 19%,  $p < 0.05$ ). Complications include wound issues, infections, etc., and were predominantly minor. The laparoscopic-laparoscopic approach thus not only hastened recovery but also reduced morbidity**

One of the most important findings of this study is that the fully laparoscopic simultaneous approach is at least as safe as, and in some aspects safer than, the mixed approach. The overall postoperative complication rate was significantly lower in Group 1 (3.9%) compared to Group 2 (18.8%) ( $p = 0.02$ ). Only 2 patients in Group 1 experienced any postoperative complication, both of which were minor: one patient had urinary retention requiring a temporary recatheterization, and another had mild referred shoulder pain from diaphragmatic irritation by CO<sub>2</sub> (resolved with analgesics). In contrast, Group 2 had 12 patients with complications. Most of these were minor as well, but they affected a substantial fraction of patients. Specifically, in Group 2 we observed: superficial surgical wound infections in 5 patients (7.8%, all at the laparotomy incision site, managed with antibiotics and local care), atelectasis or transient fever in 3 patients (managed with respiratory physiotherapy and antibiotics when needed), urinary tract infection in 2 patients, and urinary retention in 1 patient. These minor complications extended hospital stay in some Group 2 patients and increased discomfort. Only one patient in Group 2 had a major complication: she developed an incisional hernia at the open surgery incision within 2 months post-op, necessitating a hernia repair surgery later. There were no major complications in Group 1 and notably zero wound infections since no large incision was made. The difference in wound infection rate is striking (0% vs 7.8%) and underscores a clear advantage of avoiding open surgery – smaller laparoscopic incisions carry a much lower infection risk.

Why did Group 2 have a higher complication profile? The laparotomy itself introduces additional risk factors: larger incision -> higher infection risk; more pain -> reduced chest expansion -> atelectasis; longer ileus from bowel handling; and risk of incisional hernia down the line. Group 1, by eliminating the laparotomy, avoided these issues. Our data confirm that adding a gynecologic procedure laparoscopically does not compound the complication rate of a laparoscopic cholecystectomy; if anything, it keeps the overall morbidity low. This finding is supported by Matsuo et al., who observed in a nationwide analysis that surgical morbidity was not significantly different between patients who had a concurrent gynecologic laparoscopy at cholecystectomy vs those who did not. In fact, their adjusted odds ratio for morbidity with concurrent procedures was 1.39 but with a 95% CI overlapping 1 (0.75–2.59), indicating no statistical increase. Our results align with that large study, suggesting that performing two minimally invasive procedures together is safe in experienced hands.

It is important to highlight that none of the patients in Group 1 required reoperation or readmission. Meanwhile, in Group 2, two patients (3%) were readmitted after discharge due to wound complications

(one for IV antibiotics for cellulitis, another for hernia as noted). This further emphasizes the benefit of fewer incision-related problems in the laparoscopic group.

From a cosmetic and quality of life standpoint, Group 1 clearly had superior outcomes. The small port incisions heal with minimal scarring. Figure 4 illustrates the typical appearance of laparoscopic cholecystectomy incisions in a patient at one week post-op – only a few centimeter-size scars indicated by arrows. In Group 1 patients who also had laparoscopic gynecologic surgery, no additional large scars were made, so their abdomen looks similar (just a few small scars) even after two procedures. In contrast, Group 2 patients had, in addition to such small laparoscopic scars, a lower abdominal incision (often ~10–15 cm). Even though many gynecologic surgeons use cosmetically acceptable low transverse incisions, it is still a permanent scar and a potential site of hernia or adhesions. Patients in Group 1 expressed high satisfaction with the cosmetic outcome and the fact that they “felt like only one surgery was done” despite treating two issues. Those in Group 2 understandably had more pain and a visible scar, with some stating they would have preferred a single minimally invasive surgery if given the option.



**Figure 4: Typical small incisions from laparoscopic cholecystectomy (photo at 1 week post-op, red arrows). Fully laparoscopic simultaneous surgery results in only a few similar small scars even when two procedures are done, offering an excellent cosmetic outcome**

Our findings provide clinical justification that a simultaneous laparoscopic approach is the optimal strategy when both a gallbladder operation and a pelvic operation are needed. The relevance to surgical practice is significant: Instead of staging the surgeries weeks apart (with two recoveries), or combining them but subjecting the patient to a laparotomy, one can safely do both with laparoscopy. This approach harnesses the well-known benefits of minimally invasive surgery – less pain, shorter hospitalization, faster return to work, and lower complication rates – and extends those benefits to complex scenarios involving multiple pathologies. Our study specifically demonstrates that even when two surgical teams operate sequentially in one session, the patient outcomes are superior if both teams use laparoscopic techniques.

It is instructive to compare our hybrid Group 2 results with what might occur if the procedures were done separately. Group 2 patients essentially experienced the full morbidity of an open pelvic surgery (5–7 day stay, wound pain, etc.) plus a minor impact from a laparoscopic cholecystectomy (which usually has a 1 day stay). Had those patients undergone two separate surgeries in different sessions, they likely would have had one short stay for the lap chole and another week-long stay for the open gynecology surgery – totaling even more hospital days and two recovery periods. By performing them in one session, we at least spared them a second anesthesia and interim period of illness. However, the ideal is to also spare them the morbidity of the open surgery altogether, which is what Group 1 achieved.

Our data, combined with prior literature, strongly support that whenever the gynecologic condition is amenable to laparoscopic treatment, a fully laparoscopic simultaneous surgery is justified and beneficial. The scenario in which a hybrid approach (lap + open) might still be necessary is if the pelvic disease is too complex or large for safe laparoscopy (for example, a very large uterine fibroid ~20 cm, or invasive

malignancy where oncologic principles require open surgery). In our series we had some cases triaged to Group 2 for such reasons. But with advancing laparoscopic skills and instruments (e.g. power morcellators, advanced hemostatic devices), the threshold for what can be done laparoscopically continues to move. Indeed, what was considered too complex for laparoscopy a decade ago (like large fibroid uteri) is now routinely done at many centers. We expect that the need for a hybrid approach will further diminish over time, making simultaneous dual laparoscopy an option for an even larger proportion of patients.

Our results are in concordance with Brekhov et al. (2010), who concluded that “simultaneous laparoscopic surgery proved to be more preferable” than laparoscopic + open, citing lower operative stress, earlier mobilization, and better cosmetic and economic outcomes. We have now provided quantitative evidence of those advantages. We also observed what Brekhov’s team noted: the ability to perform manipulations at different levels of the abdominal cavity laparoscopically without needing to re-position excessively or make additional incisions. The cooperation between surgical specialties is key – in our model, a gynecologist and general surgeon operate together, each focusing on their field but sharing the laparoscopic access. This interdisciplinary approach is a paradigm for comprehensive minimally invasive surgery and requires proper scheduling and teamwork, but clearly it yields dividends in patient outcomes.

From an economic perspective, performing one combined surgery instead of two separate operations is cost-saving for both the hospital and patient. Although we did not perform a formal cost analysis, the shorter hospital stay and avoidance of duplicate anesthesia and operating room fees suggest a significant reduction in total cost. Gümüş et al. noted that combined endoscopic procedures can be cost-effective for healthcare systems because they eliminate a second hospitalization and surgery. In our setting, Group 1 patients had approximately half the total hospital days of Group 2 (and would have even fewer compared to two-stage surgery). Fewer complications also translate to lower costs (e.g. avoiding wound care costs, treatment of infections, etc.). Patients also incur less indirect cost, as they return to work or daily activities faster. Several patients in Group 1 were back to desk jobs by 2–3 weeks post-op, whereas those in Group 2 often needed 6–8 weeks to fully recover from the laparotomy. Thus, beyond clinical metrics, the quality of life and socio-economic benefits strongly favor the simultaneous laparoscopic approach.

We acknowledge that this study was not randomized; thus, there is a potential selection bias in that some cases were selected for open surgery due to complexity. This could exaggerate differences if Group 2 inherently had more severe pathology. However, the baseline data (Table 1) show similar distributions of conditions between groups. Moreover, even if some bias existed, the advantages observed in Group 1 (pain, recovery) are largely attributable to the surgical approach itself rather than underlying disease severity. Another limitation is the sample size; while 115 patients is a substantial series for a single center, some subgroup analyses (e.g. comparing only hysterectomy cases between groups) would be underpowered. Despite this, the differences in major outcomes were large enough to reach statistical significance. Lastly, we focused on short-term outcomes up to 30 days; long-term outcomes (such as adhesive bowel obstruction or hernia occurrence) were not systematically tracked beyond that. It is worth noting that laparotomies carry a known risk of adhesion formation, which could lead to future complications – an aspect that further favors minimally invasive surgery.

Our results reinforce the accumulating evidence that combined laparoscopic procedures are safe and effective. A 2010 Indian study by Savita and colleagues examined 401 cases of procedures combined with lap cholecystectomy and found no increase in morbidity or hospital stay compared to when those procedures were done separately. They reported a mean hospital stay of ~3.2 days for combined lap procedures, identical to what we found for Group 1, and concluded that patients benefited from single anesthesia and minimal incisions without added risk. Another series by Griffin et al. (2006) that looked at combined open hysterectomy, cholecystectomy, and appendectomy in one session had a much longer average hospital stay (~9 days) and wound complication rate of ~12% – outcomes similar to our Group 2 and far worse than our Group 1. This stark contrast highlights how moving from an open combined approach to a laparoscopic combined approach dramatically improves results.

A more recent trend is even to perform such combined surgeries as outpatient procedures in select cases. Matsuo et al. noted that many concurrent gynecologic laparoscopies with cholecystectomy in the US were done in ambulatory surgery centers, implying patients went home the same day. While same-day discharge is generally feasible for routine laparoscopic cholecystectomy, adding a laparoscopic hysterectomy often necessitates overnight observation for pain control. In our practice, we kept Group 1 patients for at least one night. However, for smaller interventions (e.g. cholecystectomy + ovarian cystectomy), outpatient combined surgery is a real possibility given the low pain and high safety profile. This could be an area of future expansion – to see if a truly outpatient dual procedure is viable, further pushing the envelope of efficiency.

In summary, the combination of laparoscopic cholecystectomy with simultaneous laparoscopic pelvic surgery offers a synergistic benefit: the patient undergoes one extended minimally invasive procedure and in return avoids a second operation and achieves a faster, easier recovery. The present study provides clinical evidence supporting this approach. Patients in Group 1 experienced less overall surgical trauma (as reflected by lower blood loss and pain) and gained the benefits of early mobilization and discharge. The data dispel concerns that doing “too much at once” laparoscopically might harm the patient; on the contrary, our patients did better than those who had part of the surgery done open. The early activation and shorter convalescence observed in the fully laparoscopic group is aligned with enhanced recovery principles and is likely to improve long-term outcomes as well (earlier return to full activity, less risk of chronic pain or incisional hernias).

We advocate that when a female patient presents with gallstones requiring cholecystectomy and has a known benign gynecologic condition that also merits surgery, an effort should be made to coordinate a single-stage laparoscopic solution. This requires the general surgeon and gynecologist to plan together, but yields considerable advantages to the patient. With growing expertise in minimally invasive gynecology, even traditionally challenging surgeries like myomectomy and hysterectomy can be done laparoscopically in the same session as cholecystectomy. As shown in our series and others, such combined laparoscopic surgeries are safe, efficient, and beneficial, providing a strong clinical justification for their use. In the modern era, patients increasingly prefer minimally invasive options; offering a combined laparoscopic operation when indicated aligns with patient-centered care by minimizing the interventions needed to restore health.

### Conclusions

1. Simultaneous laparoscopic interventions are safe and effective: Women with gallstone disease and concurrent pelvic pathology can be treated in one surgical session without added risk. Our study found no increase in major complications when performing laparoscopic cholecystectomy and laparoscopic gynecologic surgery together, compared to a mixed approach. On the contrary, the fully laparoscopic approach significantly reduced overall morbidity.
2. Fully laparoscopic combined surgery improves recovery outcomes: Patients who underwent entirely laparoscopic simultaneous surgeries experienced earlier mobilization, less postoperative pain, and a shorter hospital stay than those who had a laparoscopic cholecystectomy with an open pelvic surgery. Median hospitalization was reduced by about 3 days, and patients returned to normal activities much faster with the minimally invasive approach. This confirms that avoiding a laparotomy leads to markedly enhanced recovery.
3. Lower postoperative complications with laparoscopy: The incidence of wound-related complications (infection, dehiscence, hernia) was virtually eliminated in the laparoscopic-laparoscopic group. The overall complication rate was significantly lower, indicating a better safety profile. A key finding is that two laparoscopic procedures did not compound surgical stress – patients handled the combined procedure well, with stable hemodynamics and minimal perioperative issues.

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