

Retrospective Analysis of Surgical Outcomes in Patients with Chronic Liver Disease Undergoing Major SurgeryRamendra Kumar¹, Wajida Tabassum², Srikant Gupta³¹PGT 2nd Year, Department of surgery, MGM Medical College and LSK Hospital Kishanganj Bihar²PGT 2nd Year, Department of Surgery, MGM Medical College and LSK Hospital Kishanganj Bihar³Assistant Professor, Department of Surgery, MGM Medical College & LSK Hospital Kishanganj Bihar

Received: 25-08-2024 / Revised: 23-09-2024 / Accepted: 26-10-2024

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Conflict of interest: Nil

Abstract:

Background: Chronic liver disease (CLD), a global health issue, increases the likelihood of complications after major surgeries. CLD patients' diminished liver function can induce coagulopathy, infections, and poor wound healing, making surgery difficult. Despite the risks, local and regional CLD surgical outcomes data is sparse. This retrospective study examines CLD patients who underwent major surgery at MGM College and LSK Hospital in Kishanganj, including post-operative complications, mortality rates, and risk factors.

Methods: This retrospective study included 50 CLD patients who had major procedures at MGM College and LSK Hospital in 2022 and 2023. Medical records comprised patients' ages, sexes, liver function tests (Child-Pugh and MELD scores), procedures, complications, hospital stay, and death rates. Participants with proven CLD and extensive surgeries were eligible; those lacking full records or less extensive treatments were not. We employed descriptive statistics (mean, median) and comparative analysis (chi-square and t-tests) to determine if liver disease levels correlated with surgery results.

Results: The research group consisted of 50 patients, averaging 55. The population was 68% male and 32% female. 60% of patients had Child-Pugh Class B liver disease, 30% Class C. After surgery, 48% of difficulties were infections (18%), bleeding (14%), and liver failure (10%). Patient mortality was 16% within 30 days of surgery. Class C patients with higher Child-Pugh and MELD scores had 72% complications and 27.8% fatalities, indicating worse outcomes. The study found that diabetes and hypertension were co-morbidities, increasing complications and mortality.

Conclusion: Major CLD surgery increases complications and mortality, especially in advanced liver disease patients. These hazards can be reduced with careful perioperative treatment and liver function testing. This study highlights personalizing therapy to each patient's needs and advocates for more research into improving surgical outcomes for at-risk patients.

Keywords: Chronic Liver Disease, Major Surgery, Post-Operative Complications, Mortality, Child-Pugh Score, MELD Score, Surgical Outcomes, Kishanganj, Risk Factors, Liver Dysfunction.

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Introduction

Chronic liver disease (CLD) affects millions of people around the world and is a major public health problem. It covers NAFLD, cirrhosis, hepatitis, alcoholic liver disease, and more. The liver function problems caused by these diseases can lead to portal hypertension, ascites, hepatic encephalopathy, and coagulopathy [1]. The liver does many important things, such as metabolism, detoxification, protein synthesis (which makes albumin and clotting factors), and immune system control. It's hard to take care of people with CLD, especially after big surgeries, because a liver problem can affect other organs and systems [2]. Due to the liver's decreased production of clotting factors, surgery increases bleeding during and after

the operation. Portal hypertension is common in people with advanced liver disease and can make surgery more difficult. Too much blood loss and slow healing are caused by decreased tissue perfusion [3]. The liver's slower drug absorption also changes how the body responds to anaesthetics and other medicines used in surgery. Chronic liver disease surgery results are important to look into because the disease is so common and has a big effect on the whole body [4]. People with chronic liver disease who have big surgery are more likely to have problems. Problems can happen, such as bleeding, infections, slower wound healing, and liver failure [5]. Risk is greatly affected by the seriousness of liver disease, which is shown by the

Child-Pugh classification or the Model for End-Stage Liver Disease (MELD) score. Complications and death during surgery are more likely in Child-Pugh B or C patients or those with high MELD scores [6]. These categories help predict liver synthetic function, ascites, and encephalopathy, establishing surgical risks. The aberrant coagulation profile of this population causes particular problems. Since the liver produces most of the body's clotting factors, liver failure increases the risk of severe bleeding before and after surgery. The disorder is coagulopathy [7].

Hypersplenism from portal hypertension causes thrombocytopenia in CLD patients, worsening the situation. Due to haemostatic issues, surgical CLD patients may need fresh frozen plasma, platelets, and clotting factor concentrates. Surgery for chronic liver disease increases infection and haemorrhage risk. Impairment of the immune system raises the risk of liver dysfunction due to surgical site infections, pneumonia, sepsis, and other postoperative infections [8]. Protein production, including albumin, decreases, causing poor wound healing and ascites and peritonitis. Another typical postoperative issue in CLD patients is hepatic decompensation, where the operation worsens liver failure. Renal failure, encephalopathy, jaundice, and ascites may occur [9]. Following major surgeries, especially for cirrhotic individuals, acute-on-chronic liver failure (ACLF), a potentially lethal disease, is another crucial consideration.

It's commonly known that major surgery in chronic liver disease patients is dangerous, but Kishanganj needs more localised data. Surgical competence, the frequency of underlying causes (such as alcohol-related liver disease or viral hepatitis), and healthcare resources may affect chronic liver disease (CLD) patients' surgical outcomes and risk factors [10]. Most CLD surgical outcomes data originates from urban tertiary care institutions and liver transplantation units. However, surgery findings from smaller facilities like Kishanganj's MGM College and LSK Hospital, where patients may have different health profiles and less access to care, are limited [11].

Socioeconomic status, liver disease under diagnosis, and delayed healthcare presentation may also affect surgery outcomes. Why local studies are important shows the differences between rural and urban healthcare facilities, patient demography, and lifestyle issues [12]. Rural individuals with severe liver disease due to delayed detection or treatment may have worse surgical outcomes [13]. These areas may lack critical care units and blood supplies for perioperative management. This study evaluates MGM College and LSK Hospital chronic liver disease operations to fill local data gaps. The purpose is to highlight these patients' risks and

outcomes. The study's findings can assist clinical decision-making and perioperative treatment guidelines for chronic liver disease (CLD) patients in similar healthcare settings. This study examines chronic liver disease patients' major surgeries at MGM College and LSK Hospital in Kishanganj. This high-risk sample is studied for post-operative complications include infection, haemorrhage, liver failure, and surgery-related mortality. These data can show chronic liver disease patients' surgical risk factors. This research has three goals. It aims to assess chronic liver disease patients' significant surgical risks. Infections, wound healing, liver decompensation, and blood loss during and after surgery will be examined. Second, the study will investigate 30-day death rates following surgery to identify preoperative signs such liver function tests, Child-Pugh, or MELD scores that may indicate poor outcomes. Conclusions will improve chronic liver disease perioperative care to decrease infection, haemorrhage, and liver failure. This retrospective study will include 50 chronic liver disease patients who had major surgery at MGM College and LSK Hospital. The study examines the particular problems of caring for surgical patients with chronic liver disease in regional hospitals, where resources may be sparse and results may differ from those in bigger urban hospitals.

Materials and Methods

Study Design: Patients' records were reviewed for this investigation. Chronic liver disease (CLD) patients undergoing major surgeries at MGM College and LSK Hospital in Kishanganj are studied. Retrospective studies are used to assess CLD surgical results and complications. Surgery results, post-operative complications, and mortality rates will be examined in this population-specific study. Preexisting patient records are used to study liver function, surgery type, and postoperative course. This technique will evaluate CLD patient risk variables connected to poor outcomes to optimise future perioperative care.

Study Location: The research is conducted at Kishanganj's MGM College and LSK Hospital, which treats urban and rural patients. Due to its wide range of medical and surgical therapies, the facility is ideal for examining CLD patients' lengthy procedures. Regional health outcomes are relevant to this location because they reflect rural India's healthcare challenges, where specialised therapy and early diagnosis are harder to get.

Sample Size: This study included 50 chronic liver disease patients who had major surgery between [2022 and 2023]. The researchers identified patients whose medical records met inclusion and exclusion criteria during the study period. Although future research may need bigger samples to

confirm the findings, 50 is enough to uncover meaningful patterns and connections in outcomes.

Inclusion Criteria

The inclusion criteria for this study are as follows:

- Patients with a documented diagnosis of chronic liver disease based on clinical, biochemical, or radiological evidence.
- Patients who underwent major surgery, defined as procedures involving significant tissue dissection or organ manipulation, and requiring general anesthesia.
- Both male and female patients of all age groups.

The inclusion of only patients with chronic liver disease ensures that the study specifically focuses on the outcomes in this high-risk population. Including major surgeries ensures that the study captures significant perioperative risks and complications associated with liver dysfunction.

Exclusion Criteria

The exclusion criteria are:

- Patients with incomplete or missing medical records, making it difficult to assess their liver function status or post-operative outcomes.
- Patients who underwent minor surgeries, as these procedures carry a lower risk of complications and may not provide relevant data on the surgical risks faced by CLD patients.
- Patients with co-existing terminal illnesses or those receiving palliative care, where outcomes are likely influenced by factors unrelated to the surgery or chronic liver disease.

Excluding patients with incomplete data ensures the reliability of the findings, while excluding minor surgeries allows the study to focus on higher-risk procedures that provide more meaningful insight into the impact of chronic liver disease on surgical outcomes.

Data Collection: Fifty eligible patients had their medical records carefully evaluated for data collection. Patient factors include age, sex, and others.

This group includes ALT, AST, albumin, serum bilirubin, and INR. Child-Pugh and MELD scores

were used to assess liver disease. Major orthopaedic, thoracic, or abdominal surgeries were noted. Post-operative complications included bleeding, infection, wound healing, hepatic decompensation, and hospital stay. Mortality within 30 days of surgery was a key result. For patient privacy, all data was de-identified and stored securely during research.

Statistical Analysis: Data was analysed using appropriate statistical methods. Demographic data, liver function test results, and hospital stay duration were described by mean, median, standard deviation, and range. Classifying postoperative complications yielded percentages. Comparative investigations of chronic liver disease and surgical results used statistical tests. Chi-square tests were used to investigate the relationship between categorical factors including post-operative complications and liver disease severity. T-tests or Mann-Whitney U tests were used for continuous variables such as liver function test results and hospital stay time, depending on data distribution. A statistically significant association was established between chronic liver disease severity and unfavourable surgical outcomes ($p < 0.05$). The data will be reviewed in connection to the current literature to understand how chronic liver disease influences major surgical outcomes.

Results

Demographic Characteristics: Half of the study participants underwent major surgery and chronic liver disease (CLD). The mean age of 55.2 years, with a range of 35 to 77 years, showed a middle-aged to elderly population. Since men made up 64% of the sample, CLD was more common in men. Based on the Child-Pugh score, 25% of patients were Class A, 40% Class B, and 36% Class C for liver disease severity. The average MELD score for this cohort was 16.4, indicating mild liver impairment. Many patients had underlying health issues that made recovery after surgery tougher, including diabetes (20%) and hypertension (24%). Chronic renal disease was present in 12%, complicating surgery and post-op care.

Table 1: Demographic Characteristics and Liver Disease Severity (N = 50)

Variable	Number of Patients (%)	Mean (\pm SD)
Age (years)		55.2 (\pm 13.6)
Sex		
Male	32 (64%)	
Female	18 (36%)	
Liver Disease Severity		
Child-Pugh Class A	12 (24%)	
Child-Pugh Class B	20 (40%)	
Child-Pugh Class C	18 (36%)	

Mean MELD Score		16.4 (\pm 3.8)
Co-morbidities		
Diabetes Mellitus	10 (20%)	
Hypertension	12 (24%)	
Chronic Kidney Disease	6 (12%)	

Surgical Outcomes: Abdominal surgery made up 44% of the 50 surgeries studied. Twenty percent of procedures were heart, twelve percent thoracic, and ten percent orthopaedic.

One in fourteen underwent another major operation. Most patients (48%), had postoperative infections, haemorrhage, or hepatic

decompensation. Death within 30 days of surgery was 16%, compared to 11% for the entire cohort with comparable treatments. Advanced liver disease increased the likelihood of cardiovascular problems, which may have contributed to the greatest abdominal surgery complication rate (45%) and cardiac operation mortality rate (20%).

Table 2: Surgical Outcomes (N = 50)

Surgical Procedure	Number of Patients (%)	Post-Op Complications	Mortality (%)
Abdominal Surgery	22 (44%)	10 (45%)	3 (13.6%)
Cardiac Surgery	10 (20%)	6 (60%)	2 (20%)
Thoracic Surgery	6 (12%)	3 (50%)	1 (16.7%)
Orthopedic Surgery	5 (10%)	2 (40%)	1 (20%)
Other Major Surgeries	7 (14%)	3 (42.8%)	1 (14.3%)
Total Complications		24 (48%)	8 (16%)

Analysis of Risk Factors: Child-Pugh and MELD scores, which evaluate liver disease severity, substantially linked with surgery complications and death. Compared to Class B patients, who experienced 40% difficulties and 15% deaths, Class C patients had 72% complications and 27.8% deaths. Class A patients had the lowest complication rate (25%), and no fatality. Poor liver function increases the chance of poor surgical results, emphasising its importance. Patients with

MELD scores > 15 had higher rates of complications (66.7%) and death (23.3%), highlighting liver dysfunction as a critical risk factor. Co-morbidities like hypertension and diabetes increased complications and mortality.

People with hypertension had 66.7% complications and 25% deaths, compared to 70% for diabetics. These data suggest thorough pre-operative management and optimisation of co-morbid conditions can improve CLD surgical outcomes.

Table 3: Risk Factors and Surgical Outcomes

Risk Factor	Post-Op Complications (%)	Mortality (%)
Child-Pugh Class A	3 (25%)	0 (0%)
Child-Pugh Class B	8 (40%)	3 (15%)
Child-Pugh Class C	13 (72%)	5 (27.8%)
MELD Score < 15	4 (25%)	1 (6.2%)
MELD Score \geq 15	20 (66.7%)	7 (23.3%)
Presence of Diabetes	7 (70%)	2 (20%)
Presence of Hypertension	8 (66.7%)	3 (25%)

Discussion

Interpretation of Results: This study found that chronic liver disease (CLD) significantly impacts surgical outcomes. Child-Pugh and MELD ratings showed that patients with severe liver dysfunction had more postoperative complications and mortality. Patient with Child-Pugh Class C liver sickness had the most severe consequences (72%), including fatalities (28%). That supports the idea that CLD patients' livers can't handle the load, making them more prone to difficulties after surgery. This study's group had a 16% higher mortality rate than non-CLD patients undergoing major surgery. Infections, bleeding, and liver

failure are common due to hepatic impairments in clotting factors, inflammation, and toxin clearance. Our findings support previous research indicating CLD patients are at higher risk of perioperative haemorrhage and sepsis. This study found a 60% post-operative complication rate in cardiac surgery, which may be due to MGM College and LSK Hospital's patient population or local conditions. More research is needed. The study's findings match previous research on CLD patients' surgical risks. Other studies have demonstrated reduced death rates, especially in certain surgical procedures, which may be attributable to surgical methodology, patient selection, or postoperative care. Comorbidities like diabetes and hypertension

complicate CLD therapy. This study found higher complications and fatality rates for certain illnesses. Before surgery, co-morbidities should be properly treated because they can impair the body's reaction and recovery time.

Clinical Implications: These findings affect clinical practice. The pre-operative assessment should begin with a Child-Pugh and MELD score liver function evaluation. These scores help put patients into risk categories and decide whether to have surgery. Advanced liver disease patients should evaluate all treatment options, including liver function enhancement, before surgery.

Optimising co-morbidities including hypertension and diabetes control reduces their impact on surgery. The results suggest that CLD patients may benefit from individualised intraoperative and postoperative care due to their higher risk of complications. Preventative antibiotic use, coagulation monitoring, and liver failure response are all part of this.

Patients with higher MELD scores should be closely watched following surgery since they are more likely to have complications or die. Hepatologists, anaesthesiologists, and CLD-specialized surgeons should collaborate to improve surgical results. When designing an individualised treatment plan, consider the patient's general health, operation type, and liver problem severity. Improved recovery regimens may help CLD patients recover faster and reduce surgical stress.

Limitations

This study has some drawbacks. First, the limited sample size (50 patients) may limit generalisability. More data from a larger group may reveal more subtle relationships between liver sickness severity and surgical outcomes. The retrospective medical records used for this investigation may be biased due to inconsistent or missing information. The precise liver disease control measures taken before and after surgery were absent, so the results may not be representative of the community. Finally, only MGM College and LSK Hospital in Kishanganj participated in the study. Because they are based on institutional procedures, results may not apply elsewhere. A multi-center study is needed to investigate how institutions affect CLD surgical outcomes.

Future Research

To understand how CLD affects surgical outcomes, larger, prospective trials are needed. Studies on heart or abdominal surgeries may reveal how liver disease impacts other surgical outcomes. We need more research on how co-morbidities and CLD affect surgical risk. Prospective trials could investigate pharmacological therapy or nutritional support as pre-operative optimisation strategies to

improve CLD outcomes and reduce operation complications.

Conclusion

This study shows that people with chronic liver disease (CLD), especially those whose liver failure is more advanced, are more likely to have serious problems after major surgery. The results show that patients with higher Child-Pugh and MELD scores have a much higher chance of having problems after surgery and dying. Overall, complications happened 48% of the time in this study, and 16% of patients died. This shows how important it is to carefully care for these patients before and after surgery. Before surgery, checking how well the liver is working is very important for finding patients who are likely to have bad results. Improving liver function and other health problems before surgery can also greatly help patients' outcomes. Individualised care plans, better monitoring, and quick action for any problems are important parts of a good surgical management plan for CLD patients. This study gives us useful information, but it has some problems, like a small sample size and only looking at one school. We need to do more research to fully understand what factors affect how well surgery works for CLD patients. Prospective, multi-center studies could give us more information and help us make suggestions based on evidence for how to care for these complicated patients. To make surgery go more smoothly for people with CLD, we need to take a combined method that looks at how liver disease severity, other health problems, and surgical factors all affect each other.

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