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Original Research Article

Intraoperative Findings of Elective Laparoscopic Cholecystectomy in Diabetics Versus Nondiabetics: A Retrospective Comparative Study at JLNMCH Bhagalpur

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Abstract:

Background: Diabetes mellitus (DM) is a well-recognized risk factor for gallstone disease and may influence intraoperative findings during laparoscopic cholecystectomy (LC). Dense adhesions, contracted gallbladder, and difficult Calot's triangle dissection are frequently reported in diabetic patients, potentially complicating surgery and prolonging operative time.

Objective: To compare intraoperative findings of elective LC between diabetic and non-diabetic patients.

Methods: This retrospective study was conducted in the Department of Surgery, JLNMCH Bhagalpur, over one year. Medical records of 80 patients who underwent elective LC for symptomatic cholelithiasis were analyzed, including 35 diabetics and 45 non-diabetics. Intraoperative parameters assessed were gallbladder wall thickness, adhesions at Calot's triangle, presence of contracted or distended gallbladder, intraoperative bile spillage, conversion to open surgery, and operative duration. Data were compared between groups using chi-square and t-tests.

Results: Diabetic patients had a significantly higher incidence of dense adhesions at Calot's triangle (57.1% vs. 24.4%, p=0.01) and thickened gallbladder wall (>3 mm) (62.9% vs. 26.7%, p=0.002). Contracted gallbladder was observed in 31.4% of diabetics versus 13.3% of non-diabetics (p=0.04). Bile spillage occurred in 22.9% of diabetics compared to 9.8% of non-diabetics. Conversion to open cholecystectomy was higher in diabetics (11.4% vs. 2.2%), though not statistically significant. Mean operative duration was longer in diabetics (74.2 ± 12.6 min vs. 61.8 ± 10.4 min, p<0.01).

Conclusion: Diabetic patients undergoing LC have more technically challenging intraoperative findings, including thickened gallbladder walls, dense adhesions, and longer operative times. These results emphasize the need for careful preoperative evaluation, anticipation of difficult dissection, and readiness for conversion in diabetic patients. Biliary spillage percentage should be minimized in both conditions to some extent.

Keywords: Diabetes mellitus, laparoscopic cholecystectomy, intraoperative findings, Calot's triangle, gallstones

Introduction

Gallstone disease is a common surgical problem worldwide, and laparoscopic cholecystectomy is the gold standard treatment for symptomatic cholelithiasis. Diabetes mellitus (DM), due to its chronic inflammatory milieu and associated metabolic changes, predisposes patients to gallstone formation and altered gallbladder motility. These pathophysiological factors may lead to increased gallbladder wall thickening, fibrosis, and adhesions, complicating surgical dissection.

Previous studies have suggested that diabetic patients experience greater intraoperative difficulty and longer operative duration. However, comparative data in the Indian population are limited, particularly in tertiary teaching hospitals. This study was conducted to compare intraoperative findings of elective LC between diabetic and non-diabetic patients at JLNMCH Bhagalpur.

Objectives

1. To assess and compare gallbladder wall thickness between diabetic and non-diabetic patients.
2. To evaluate the incidence of adhesions at Calot's triangle in both groups.
3. To compare operative time, intraoperative bile spillage, and conversion rates between groups.

4. To analyze the overall surgical difficulty in diabetics versus non-diabetics.

Study Design and Setting: A retrospective observational comparative study was conducted in the Department of Surgery, JLNMCH Bhagalpur, covering a period of 18 months (January 2024 to June 2025).

Participants

- **Inclusion:** Patients who underwent elective LC for symptomatic gallstone disease.
- **Exclusion:** Acute cholecystitis, empyema, gallbladder carcinoma, and incomplete medical records.
- **Sample size:** 80 patients (35 diabetics, 45 non-diabetics).

Outcomes

- **Primary outcomes:** Gallbladder wall thickness, adhesions at Calot's triangle, operative time.
- **Secondary outcomes:** Intraoperative bile spillage, conversion to open surgery, gallbladder morphology (contracted/distended).

Materials and Methods

Data were extracted from operative notes, anesthesia records, and pathology reports. Gallbladder wall >3 mm was defined as thickened. Adhesions were graded as absent, flimsy, or dense. Operative time was recorded from first incision to skin closure.

Statistical analysis was performed using SPSS v25. Continuous variables were compared with Student's t-test and categorical variables with chi-square test. A p-value <0.05 was considered significant.

Results

Demographics

- Mean age: 52.6 ± 11.3 years in diabetics vs. 48.2 ± 10.7 years in non-diabetics.
- Female predominance in both groups (diabetics: 60%, non-diabetics: 64%)

Table 1. Intraoperative Findings in Diabetic vs Non-Diabetic Patients

Finding	Diabetics (n=35)	Non-diabetics (n=45)	p-value
Gallbladder wall >3 mm	22 (62.9%)	12 (26.7%)	0.002
Dense adhesions at Calot's	20 (57.1%)	11 (24.4%)	0.01
Contracted gallbladder	11 (31.4%)	6 (13.3%)	0.04
Bile spillage	8 (22.9%)	4 (9.8%)	0.08
Conversion to open surgery	4 (11.4%)	1 (2.2%)	0.12
Mean operative time (minutes)	74.2 ± 12.6	61.8 ± 10.4	<0.01

Discussion

This study highlights the increased intraoperative challenges faced during laparoscopic cholecystectomy in diabetic patients. A significantly higher incidence of gallbladder wall thickening and dense adhesions at Calot's triangle was observed in diabetics compared to non-diabetics. These findings corroborate prior studies suggesting that chronic inflammation and impaired immunity in diabetics lead to fibrosis and scarring, complicating dissection.

Although the conversion rate was higher among diabetics (11.4% vs. 2.2%), statistical significance was not reached, likely due to sample size. However, the clear trend warrants anticipation of possible conversion in diabetic cases. Operative time was significantly longer in diabetics, reflecting increased surgical difficulty.

The results emphasize the need for meticulous preoperative evaluation, including ultrasonographic assessment of gallbladder wall thickness, optimization of glycemic status, and ensuring availability of experienced surgeons for diabetic patients.

Conclusion

Diabetic patients undergoing elective LC have significantly higher rates of gallbladder wall thickening, adhesions, and operative difficulty compared to non-diabetics. Although conversion rates were not statistically different, operative duration was significantly prolonged. Surgeons should anticipate greater technical challenges in diabetics and plan accordingly to minimize complications.

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