

An Observational Study on Intra-Operative Factors, Causing Conversion in Patients Undergoing Elective Laparoscopic Cholecystectomy

Dr. Satyabrata Mishra¹, Dr. Biranchi Narayan Lenka²

¹Department of General Surgery Hitech Medical College and Hospital Bhubaneswar

²Professor, Department of General Surgery Hitech Medical College and Hospital Bhubaneswar

Abstract: *This observational descriptive study was conducted in the Department of General Surgery, Hi-Tech Medical College and Hospital, Bhubaneswar, to evaluate intra-operative and related factors leading to conversion from elective laparoscopic cholecystectomy to open cholecystectomy. A total of 52 patients aged above 15 years, initially planned for laparoscopic cholecystectomy and subsequently converted to open procedures due to complicated intra-operative findings, were included between March 2023 and February 2025. Preoperative clinical presentation, biochemical parameters, and radiological findings were assessed, along with intra-operative difficulties such as dense adhesions, distorted Calot's triangle anatomy, bleeding, and difficult gallbladder dissection, to identify predictors of conversion. The analysis highlights that specific high-risk intra-operative situations, supported by adverse preoperative clinical and imaging features, significantly increase the likelihood of conversion. Strengthening preoperative risk stratification and counseling, coupled with meticulous operative planning in anticipated difficult cases, can help reduce conversion rates, minimize complications, and improve overall outcomes in patients undergoing laparoscopic cholecystectomy.*

Keywords: Laparoscopic cholecystectomy; open cholecystectomy; conversion; intra-operative factors; difficult cholecystectomy; cholelithiasis; cholecystitis; risk factors; observational study; Calot's triangle.

1. Introduction

- Laparoscopic cholecystectomy is not only the cornerstone in the management of cholelithiasis and cholecystitis but also stands as one of the most frequently performed procedures in both elective and emergency surgery. This minimally invasive approach offers significant advantages over open cholecystectomy, benefiting both patients and the healthcare system by eliminating the need for a large incision, reducing hospitalization time, and facilitating a swifter recovery.
- The primary reasons for converting laparoscopic cholecystectomy to an open procedure are the inability to clearly delineate the anatomy and challenges during dissection, with other complications, such as bleeding, which acts as the contributing factor too. The decision to convert is significantly influenced by the patient's condition, the surgeon's expertise, and various technical considerations. The conversion rate for elective laparoscopic cholecystectomy is approximately 5%, whereas in the presence of complications like acute cholecystitis, the conversion rate rises to around 30%.
- Several complications and challenges encountered during laparoscopic cholecystectomy (LC) are associated with various aspects of the procedure, including anesthesia, peritoneal access, pneumoperitoneum, surgical exploration, adhesiolysis, dissection of Calot's triangle, clipping or ligation of the cystic duct and artery, removal of the gallbladder from its fossa, removal of the gallbladder from the peritoneal cavity, and thermo-coagulation. These complications, along with other factors, may necessitate the conversion from laparoscopic to open cholecystectomy.

2. Aims and Objectives

Aims

- This study aims to assess and evaluate the factors contributing to the conversion of laparoscopic cholecystectomy to open cholecystectomy in the contemporary era of minimally invasive surgery attributed to intra operative findings, clinical presentations, biochemical parameters and radiological evidences.

Objectives

- To identify the intraoperative findings during challenging laparoscopic cholecystectomy that lead to conversion to open cholecystectomy.
- To study preoperative clinical, biochemical and radiological parameters predicting difficulty. To contribute to the existing literature with insights into several critical aspects of laparoscopic cholecystectomy.

3. Material and Methods

- Study Design:** It is an observational, descriptive study.
- Study Area:** Department Of General Surgery, HI-TECH MEDICAL COLLEGE AND HOSPITAL.
- Study Population:** 52 patients who were prepared for laparoscopic cholecystectomy and converted to open procedure due to complicated findings during the intra-operative period.
- Study Periods:** From March 2023 to February 2025
- Sample Size:** 52 patients

Inclusion Criteria:

- Male and female patients more than 15 years of age.
- Patients whose conversions done from laparoscopic cholecystectomy to open cholecystectomy.

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- Patients willing to give written and informed consent & willing to comply.

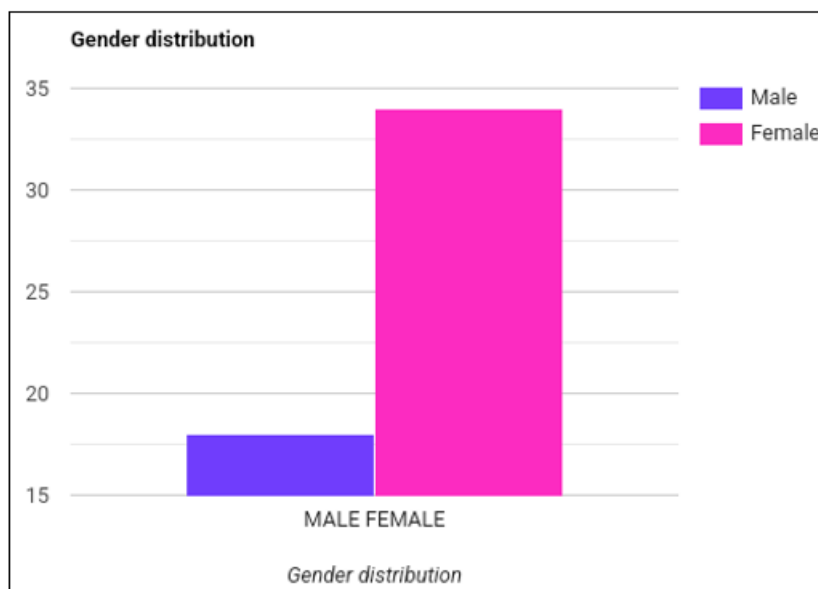
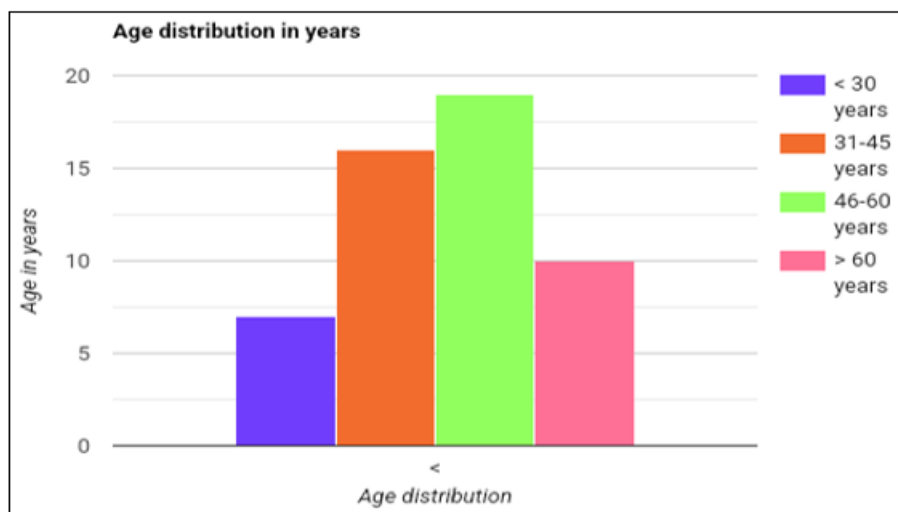
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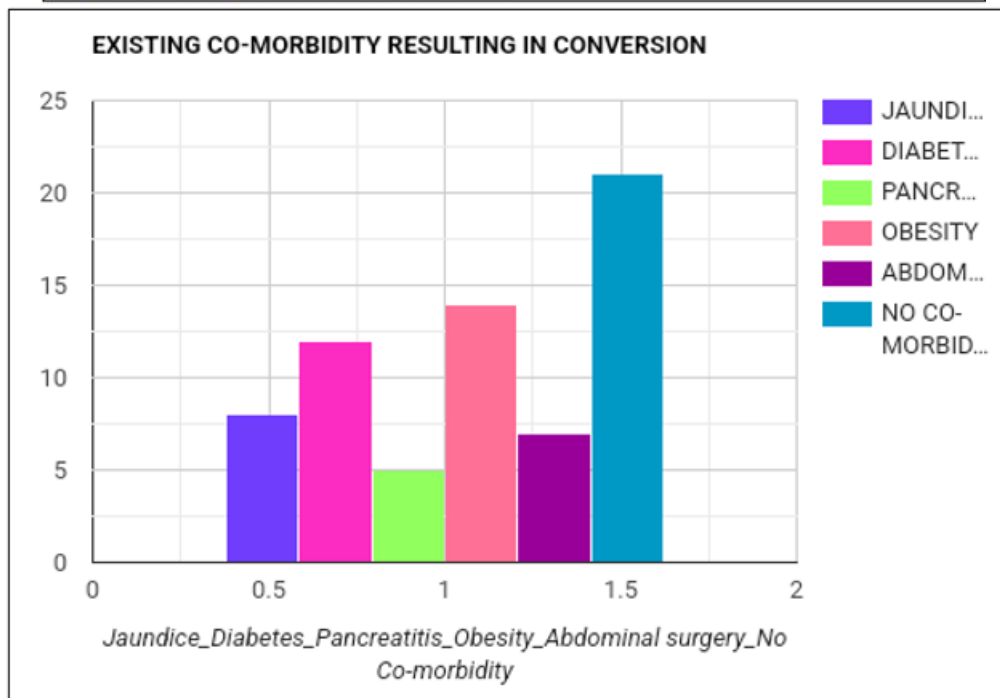
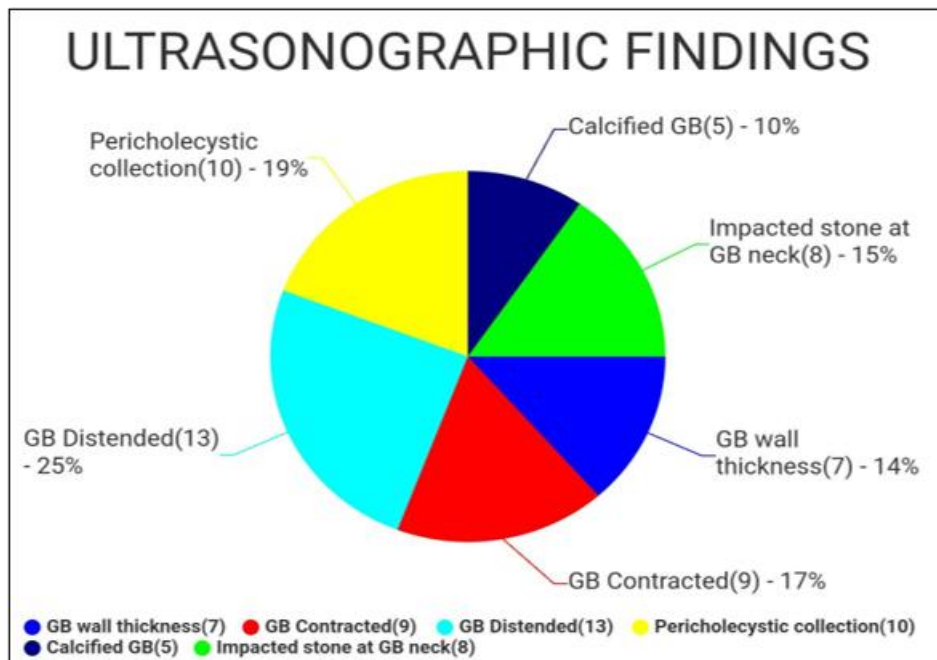
- Patient not willing to give written & informed consent and not willing to participate.
- Associated common bile duct stone.
- Suspected carcinoma gall bladder.
- Mirizzi syndrome.
- Intrahepatic gall bladder.
- Known cholecystoenteric fistula
- Instrumental failure.

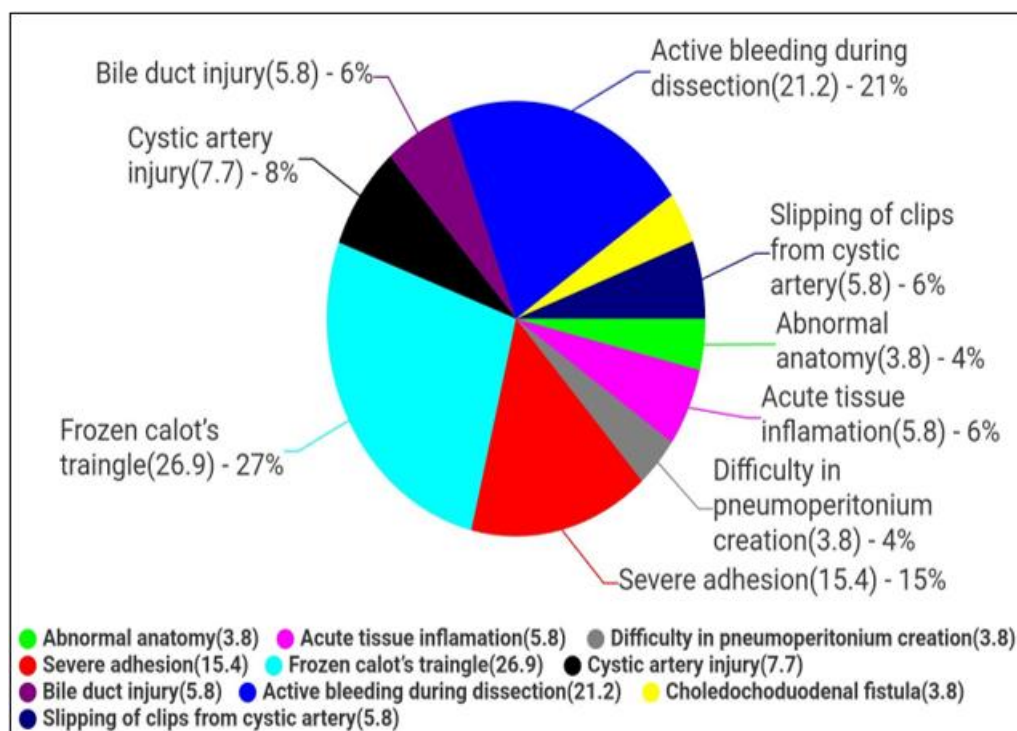
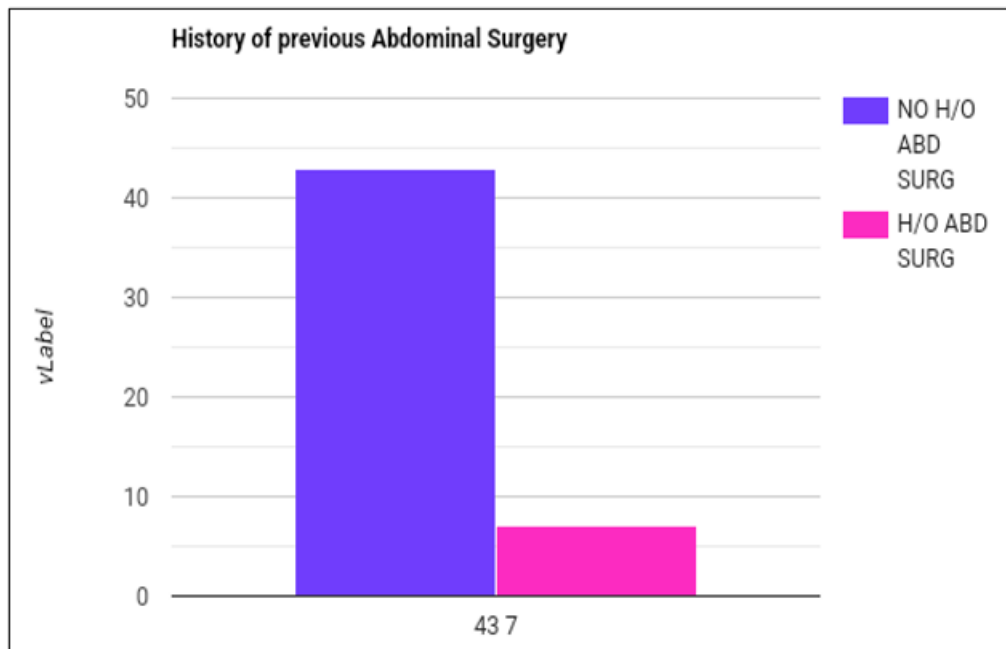
Presenting Features of Patient	Number of Patients	Percentage of Patients (%)
Acute attack once	11	21.2
Dyspepsia only	5	9.6
Recurrent attacks (Total = 32)		
– 2 attacks	23	44.2
– 3 attacks	8	15.4
– More than 3 attacks	1	1.9
Incidental findings	4	7.7
Total	52	100

Category	After One Attack	After Two Attacks	After Three Attacks	More Than Three Attacks
Adhesions Found	4	17	5	3
Adhesions Not Found	5	7	0	0

4. Observation and Conclusions







5. Conclusion

In conclusion, strengthening the preoperative evaluation process, focusing on these key risk factors, and appropriately counseling patients regarding potential surgical challenges are critical steps in minimizing the need for conversion. By taking these factors into account, surgeons can enhance their preparation, reduce complications, and ultimately improve the overall outcomes for patients undergoing laparoscopic cholecystectomy.

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