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COLLEGE OF MEDICINE AND HEALTH SCIENCE

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DEPARTMENT OF SURGERY

Outcome And Determinants Of Open Cholecystectomy In Tibebeghion Specialized Hospital,Northwest Ethiopia,2023 To 2025 : A Crossectional Study

BY: Rebeca Shimelis (MD, YEAR IV SURGERY RESIDENT)

A THESIS SUBMITTED TO THE DEPARTMENT OF SURGERY, COLLEGE OF MEDICINE AND HEALTH SCIENCES, BAHIR DAR UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT FOR GENERAL SURGERY SPECIALTY PROGRAM

JANUARY 2025

BAHIR DAR, ETHIOPIA

BAHIR DAR UNIVERSITY

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OUTCOME AND DETERMINANTS OF OPEN CHOLECYSTECTOMY IN TIBEBEGION SPECIALIZED HOSPITAL,NORTHWEST ETHIOPIA,2023 TO 2025 ,CROSSECTIONAL STUDY

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JANUARY 2025

BAHIR DAR, ETHIOPIA

Declaration

I hearby declare that this thesis entitled “OUTCOME AND DETERMINANTS OF OPEN CHOLECYSTECTOMY IN TIBEBEGHION SPECIALIZED HOSPITAL,NORTHWEST ETHIOPIA,2023 TO 2025” submitted in partial fullfilment of requirement for certefication of speciality program in General surgery, department of surgery ,Bahirdar university ,repersents an orginal work conducted by me. This thesis has not been submitted to this or any other institution institution to get any other degree or certificates. The assistance and help I received during the course of this investigation have been duly acknowledged.

Dr Rebeca Shimelis		
Name of the candidate	signature	Date

Approval of Dissertation/thesis for defense

I hereby certify that I have supervised, read, and evaluated this thesis/dissertation titled "OUTCOME AND DETERMINANTS OF OPEN CHOLECYSTECTOMY IN TIBEBEGHION SPECIALIZED HOSPITAL,NORTHWEST ETHIOPIA,2023 TO 2025"by Rebeca Shimelis prepared under my guidance. I recommend the thesis/dissertation be submitted for oral defense.

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I would like to thank all the participant of the research for their active participation in this study.

Abstract

Background. Cholecystectomy is surgical removal of gallbladder. Cholecystectomy is one of the most common procedures done worldwide. It can be done laparascopicaly or open. Open cholecystectomy is associated with increased morbidity compared with laparascopic cholecystectomy. At Tibebe Ghion Hospital, open cholecystectomy remains the primary approach for gallbladder disease due to resource limitation. However, no study has been conducted to evaluate outcome of this procedure. This study aims to assess the outcome and associated factors of open cholecystectomy.

Objectives: This study aimed to evaluate the clinical outcome and associated factors of open cholecystectomys in Tibebe Gion specialized hospital

Methods and materials: The study was conducted using a cross-sectional and clinical study over a two-year period and included all patients who underwent open cholecystectomy in Tibebe Ghion Specialized Hospital ,Department of Surgery from January 2023 to January 2025 G.C. Data, collected with a structured tool, were entered into Kobo toolbox and analyzed with SPSS version 25. A binary logistic regression model identified associated factors, with a significance threshold set at $P < 0.05$ in multivariate analysis.

Result: Among the 171 operated cases, females predominated at 69.6%, .The study revealed 25 patients(14.6%) unfavorable clinical outcomes as measured by Modified Clavien-Dindo Classification. With Multivariate analysis, there were significant associations between unfavorable outcome and factors such as emergency operation and rural residency.

Conclusion: The overall outcome open cholecystectomy in this study was favorable (85.4%). Unfavorable outcomes observed with emergency operation and patient from rural areas.

Recommendations: Improvement in infrastructure and close access of health center to rural area are crucial to mitigate unfavorable outcomes

Key words- Open cholecystectomy ,clinical outcomes, BahirDar

ACRONYMS AND ABBREVIATIONS

ASA- American society of Ansthesiologist

DM- Diabetes mellitus

HIV- Human Immunodeficiency Virus

LC- Laparascopic Cholecystectomy

MCDC – Modified Clavien-Dindo Classification

OC- Open Cholecystectomy

SSI- Surgical site infection

TGSH - TibebeGion Specialized Hospital

TABLE OF CONTENT

Contents

ADDRESS .....**Error! Bookmark not defined.**

Acknowledgement ..... I**Error! Bookmark not defined.**

Summery ……..……IVI

List of Acronyms and Abbreviations..... VI

Table of Contents..... **Error! Bookmark not defined.**I

List of tables..... **Error! Bookmark not defined.**I

List of figueres…….……..……IX

1. INTRODUCTION .....**Error! Bookmark not defined.**

1.1 Background .....**Error! Bookmark not defined.**

1.2 Statment of the proplem .....**Error! Bookmark not defined.**

1.3. Significance of the study..... 3

2. LITERATURE REVIEW 4

2.1. Determinants of outcome 6

2.2. Outcome .....**Error! Bookmark not defined.**

2.3 Conceptual framework……...8

3 OBJECTIVES OF THE STUDY..... 9

3.1. General objective 9

3.2 Specific objectives.....**Error! Bookmark not defined.**9

4. METHODs AND MATERIALIS .....**Error! Bookmark not defined.**0

4.1. Study area.....**Error! Bookmark not defined.**0

4.2. Study design and period..... 10

4.3. Population..... 10

4.3.1. source population..... 10

4.3.2. Study Population..... 10
4.3. Eligibility Criteria 10
4.3.1. Inclusion Criteria 10
4.3.2. Exclusion Criteria 10
4.4 Study Variables 10
4.5. Operational Definition..... 11
4.5 Sample size determination…….....11
4.6 Sampling technique……11
4.7. Data Collection Procedure and Instrument 11
4.8. Data Processing and Analysis 12
. 4.9 Ethical consideration..... 12
4.10. Dissemination 12
5. Result 13
6. Discussion..... 20
7. Conclusion ……..23
8. Recommendation…….23
9. References 24
10.ANNEX.....27

LIST OF TABLES

Table 1:Modified Clavien-Dindo classification ……..….6

Table 2: Socio-Demographic Characteristics of patients who underwent open cholecystectomy in TGSH, 2025……...13

Table 3: Frequency Distribution of Clinical Presentation of patients who underwent open cholecystectomy in TGSH, 2025……..15

Table 4: length of hospital stay of patients who underwent open cholecystectomy in TGSH,2025 ……..17

Table 5: Factors associated with unfavorable clinical outcome of patients who underwent open cholecystectomy in TGSH, 2025……..19

LIST OF FIGURE

Figure 1: Conceptual framework …….....10

Figure 2: Duration of illness at presentation of patients who underwent open cholecystectomy at TGSH ,2025……14

Figure 3: Type of surgery of patients who underwent open cholecystectomy at TGSH from , 2025……16

Figure 4: Postoperative complications based on Modified ClavinDindo classification…18

1. INTRODUCTION

1.1 Background information

Cholecystectomy is surgical removal of gallbladder. Carl Langebuch of Germany performed the first cholecystectomy in 1882 and approximately 103 years later Prof Dr Erich Mühe of Germany performed the first laparoscopic cholecystectomy(1, 2) . For more than 100 years, open cholecytectomy(OC) was standard of management for gallbladder disease. With advancement of medicine, laparoscopic cholecystectomy(LC) become the gold standard management for gallbladder disease. LC provides cure with minor scar, pain and early return to daily activities(3). Indication for cholecystectomy includes symptomatic cholelithiasis, complicated gallstone disease, biliary dyskinesia, acalculouscholecystitis, gallbladder polyp, gallbladder malignancy and premalignant condition.

Cholecystectomy is standard of management for gallstone disease. Gallbladder stones have been recognized historically in Egyptian mummies and Vesalius and Fallopius described stone in gallbladder of humans (2).Gallstones represent huge burden to health care system. It affect 10-15% of population in western countries and these burden appears to be increasing in developed countries (4). Prevalence in Africa is 0 -10% and up to 60-70% in Pima Indians. Studies show lower prevalence in subsahrancountries ,approximately 5% compared to global rate with recent surge due to obesity ,modernization and urbanization. Risk factors include age, genetics, female gender,obeity,diet, use of total parentral nutrition(TPN), medications, Inflammatory bowel diseae(IBD) and ileal resection(4).
Its more common in females and 4-10 time more common in old age(5). Female are at increased risk in developing gallstone disease and having surgery(4). Women are three times likely to develop gallstones (2). Both pregnancy and low dose oestrogen therapy is associated with increased risk of having gallstone(6).

Up to 80% of patients with gallstone are asymptomatic and 2 to 3% of these patients become symptomatic yearly(2).Patient typically present with steady right upper quadrant abdominal pain or epigatric pain lasting 30min to few hours (biliary colic). Patient may also present with other abdominal complaint (atypical presentation) such as left upper quadrant pain, dyspepsia bloating, nausea, belching and may warrant further investigation to rullout other causes. Complicated

gallstone disease includes acute or chronic cholecystitis, gallbladder empyema, gallbladder perforation, biliary obstruction, acute cholangitis, acute pancreatits and gallstone ileus.

1.2 Statement of the problem

Cholecystectomy is one of the most common abdominal operations, In developed country 10% of white adult harbor cholesterol gallstone (5), With 750,000 cholecystectomy performed yearly in United States(2) and nearly 10,000 deaths result from complications or treatment (7). Its complication consume $6.5 billion in United States (5). Slow recovery, pain, Low job satisfaction resulting in delay return to work (8) . 60% of additional costs of employed patients related to sick leave of employees(9)

Open cholecystectomy(OC) remains as main stay management for gallbladder disease in resources limited countries. In resource limited country such as sudan,OC is still widely practiced among due to the high cost of laparoscopic cholecystectomy and lack of trained professionals(10)OC is invasive procedure and postoperatively complications might occur. OC is associated with increased morbidity due to considerable complications and prolonged hospital stay(10).These complications include pain, surgical site infections , delayed mobility, prolonged hospital stay, adhesion formation and incisional hernia.

.

1.3 Significance of study

Open cholecytectomy is being done all over Ethiopia for different indications. Although OC is widely practiced in our country, there are limited studies done in Ethiopia that focused on the outcomes of this procedure. This study will explore the possible outcomes of this invasive procedure and various factors that influence the outcome and aim to enhance Our knowledge of this procedure and determinants of the outcome.

The scarcities of previous studies focusing on OC in our country underscore the need of compressive study in this domain. Being conducted in tertiary hospital with substantial patient flow from wide region, this study will provide valuable and broad insight into outcomes of this procedure.

Data generated from this study will be instrumental for health care professionals and researchers especially for those living in resources limited countries where the procedure is widely performed. It will help health care providers and policy makers to improve the health care service. This study can demonstrate the burden that come with performing open procedures and can be evidence to show health care providers and facilities, the need for modernization of the healthcare service in general and the need for transition of open procedures to laparascopic ones.

2. LITERATURE REVIEW

Open cholecystectomy was standard of procedure for gallbladder disease before 1991.With advent of laparoscopic surgeries, LC become gold standard management for gallbladder disease and rate of OC has declined. LC is one of the most commonly performed procedure in United States (1). LC results lower complication rate and mortality. The superiority of this procedure is due to substantial decrease in "trauma of access" which in turn decrease cytokine release and with smaller wound size, less pain ,infection or hernia(11). Although its safe procedure, complication may arise. These include CBD injury(0.49-1.2%), vascular or bowel injury, complication related to pneumoperitonium and trocar site hernia (12).

Even in best setup, Surgeons may be forced to change to open cholecystectomy when LC is difficult.Aro .Most series show conversion rate of 5-10%(12). The conversion rate varies based on the experience of the surgeon.Risk factors that increase the conversion to OC includes age above 65 years, obese patients, interval elective LC for acute cholecystitis, patients with thickened gallbladder wall on ultrasound and patients whose surgery was performed by senior surgeons(13) . complicated gallbladder pathology such as gallbladder cancer, intraabdominal adhesions and sever inflammation require open approach(12).

Although LC has remarkable progress as standard procedure, its establishment in low resource country especially in public hospitals has been challenging(14). LC need advanced equipment and training which is not widely available in most part of developing countries(7). LC needs proper functioning laparoscopic device , consistent electric supply and skilled personnel(14). Implementation of LC in country like Ethiopia has been hampered by inadequate equipment, resource and trained expertise(14).

There have been efforts to establish laparascopic surgeries in Ethiopia. American college of surgeons' hub in Hawassa(ACS) Training Hubs Help Build Surgical Capacity in Africa(14). There are few public institution making effort to in cooperate laparascopic surgery but not yet established as standard procedure (15). Despite the effort, open cholecystectomy is widely performed .

Determinants of outcome

Age is important risk factor for gallstone. The incidence of gallstone increases with age .This is mainly due to increased cholesterol secretion and saturation in bile(16). 50% of female and 60% of male in their 70s has gall stone(17). Treatment is also challenging in these groups. Elderly patient has limited functional reserve patient above 70 have higher incidence of complicated gallstone disease such as acute cholecystitis, choledocholithasis or biliary pancreatitis(18).Up to 55% of these patients has complicated gallstone disease and frequently suffer from comorbidity resulting higher preoperative mortality and postoperative complications (17) .

Patient with comorbidities such as diabetes mellitus (DM) has higher postoperative complications. Diabetic patients has poor wound healing secondary to tissue hypoxia resulting from stiff vascular wall and chronic hyperglycemia(19). Infectious complications(wound complications, hepatic abscess, respiratory complications) were higher in diabetics patients(19).

Obesity is well defined risk factor for gallstone disease. It also affects the outcome of cholecystectomy by increasing the number and burden of postoperative complication.(20)

Outcome of open cholecystectomy

Open cholecytectomyis associated with increased pain, hospital stay and other complications . Mortality rate of open cholectectomy is 0.3%(21). Compared to laparoscopic cholecystectomy ,open cholecystectomy is associated with increased mortality(5% vs !%) and morbidity(7.7% vs 1.9%)(22).

Number of complications can arise after cholecystectomy. The complications could be non biliary or biliary. Biliary complication includes biliary leak, surgical site infection, stricture, retained stone, hernia and persistent postoperative pain. Non biliary complications include postoperative adhesion, pneumonia , cardiac complications and others(22).

In 1992 ,Clavien proposed a stratification of complication severity which was later improved by Dindo resulting Clavien-Dindo classification in 2004(23, 24). It provides standardized way of reporting surgical complications .The aim of this stratification is to have uniform way of reporting negative outcomes by differentiating complications, sequel, and failures(23).

Table 1 Clavien-Dindo(CD) classification of surgical complications.(24)

Grade I	If Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic, and radiological interventions Allowed therapeutic regimens are: drugs as antiemetics, antipyretics, analgetics, diuretics, electrolytes, and physiotherapy. This grade also includes wound infections opened at the bedside
Grade II	Requiring pharmacological treatment with drugs other than such allowed for grade I complications Blood transfusions and total parenteral nutrition are also included
Grade III	Requiring surgical, endoscopic or radiological intervention Grade IIIa Intervention not under general anesthesia Grade IIIb Intervention under general anesthesia
Grade IV	Life-threatening complication (including CNS complications)* requiring IC/ICU management Grade Iva- Single organ dysfunction (including dialysis) Grade IVbMultiorgan dysfunction
Grade v	Death of a patient
	Suffix "d" If the patient suffers from a complication at the time of discharge). The suffix "d" (for "disability") is added to the respective grade of complication. This label indicates the need for a follow-up to fully evaluate the complication.

Bile injury injury is one of the most feared complications of cholecystectomy and associated with morbidity and mortality (25). It occurs in 0.1–0.2% after open cholecystectomy(26). Bile

duct injury occurs in 0.4–0.6% after Laparascopic cholecystectomy in previous 3 decades and 0.2% in recent studies owing to improvement in technique and instruments (27) .

Patient with right upper quadrant pain (RUQ) and cholelithiasis are usually offered cholecystectomy although other causes may exist and the pain may persist after surgery(22). Postcholecystectomy pain is common complaint among patient. At 6 months ,merely 47.9% of patients were symptom free(28) and up to 34% of patient still suffer from upper abdominal pain after 1 yr. The SECURE trial (Scrutinizing (in)efficient use of cholecystectomy has been implemented to address this issue by restrictive and stepwise selection of patients who will benefit from cholecystectomy. Up to 40% of patients who underwent cholecystectomy,the pain persist after the surgery(29)

Surgical site infections(SSI) is the most common complication after cholecytectomy(30). SSI is more common in open cholecystectomy compared to laparoscopic cholecytectomy (4.93% vs 0.64%) (31)

Mortality rate of open cholecystectomy range between 0.3 to 2.9%(32, 33). Patient at high risk for mortality are elderly , male and patient with previous abdominal surgery(32) .Cardiovascular complication was the most common cause of death(33).

2.3 Conceptual Framework

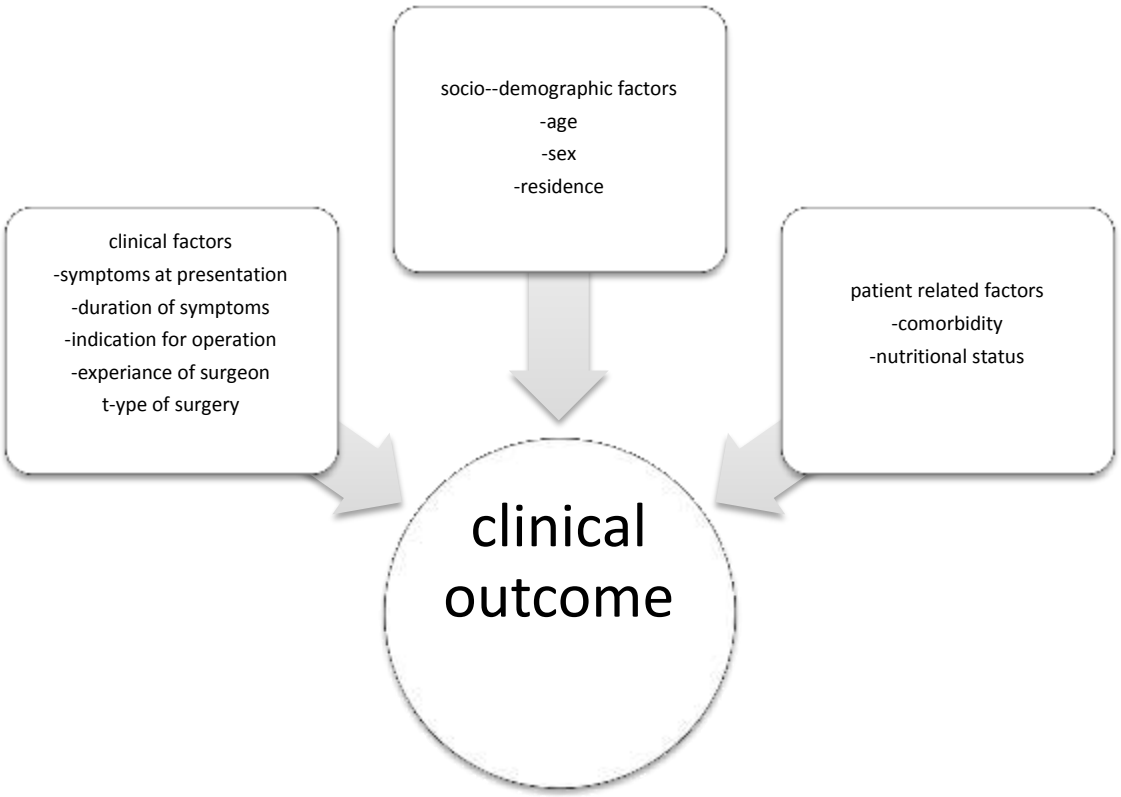

Figure 1: Clinical outcome and determinants of open cholecytectomy

3. OBJECTIVES

3.1 General objectives

- To assess the Outcome and determinant of open cholecystectomy in Tibebe Ghion Comprehensive Specialized hospital, from January 2023 to January 2025.

3.2 Specific objectives

- To assess outcome of open cholecytectomy in Tibebe Ghion Comprehensive specialized hospital from Jan 2023 to Jan 2025
- To identify determinants of outcome of open cholecystectomy in Tibebe Ghion Comprehensive Specialized hospital, from Jan 2023 to Jan 2025.

4. MATERIALS AND METHODS

4.1 Study site

The study was conducted at Tibebe Ghion Comprhensive specialized Hospital (TGSH) within the Department of General Surgery at the College of Medicine and Health Sciences, Bahir Dar University. TGSH was established in 2019 , approximately 10km south of the city center. TGSH occupied an expansive area of 10,000 square meters, dedicated to providing essential services for over five million people in the surrounding catchment area. The teaching hospital boasted a total of 472 beds, with the adult surgical section comprising around 106 beds and 8 Operating room(OR) beds and 7 surgical referal clinics divided among subspeciality

4.2 Study design

A hospital based cross-sectional observational retrospective study was utilized by reviewing patient chart from TGSH

4.3Sourseand Study population

Patients who are admitted in TGSH with diagnosis of cholelithiasis and being managed surgically from Jan 2023 to Jan 2025

4.4 Eligibility criteria

Inclusion criteria

- All patients above 18 yrs old that have undergone open cholecystectomy for benign illness at TGSH from January 2023 to January 2025

Exclusion criteria

- Patient who had cholecytectomy with concomitant malignancy
- Patient with incomplete records
- Patient with obstructive jaundice
- Patients with missing chart

4.5 Study variables

- Independent t variables are age, sex , residency, duration of symptoms, underlying comorbidities , symptom at presentation ,indication for surgery and type of surgery.
- Dependent variable is clinical outcome up to 3 month postoperatively

4.6 Operational definition

Favourable outcome- no post operative complications

Unfavorable- postoperative complication present(MCDC I TO V)

Chronic post surgical pain The ICD-11 definition of CPSP states
"Chronic postsurgical or post traumatic pain is pain developing or increasing in intensity after a surgical procedure or a tissue injury (involving any trauma including burns) and persisting beyond the healing process, i.e. at least 3 months after surgery or tissue trauma".

Mortality- is defined as death within 30 days after surgery or during hospitalization. Mortality is the rate of CD grade V complications.

Length of stay in hospital- number of days stayed in hospital since day of operation.

4.7 Sample size and Sampling technique

All patient charts who had open cholecystectomy in TGSH from January 2023 to January 2025 were included.

4.8 Data collection tools

After identifying the patients from the registers, their folders charts were retrieved from hospital records. Information regarding patient demographics and their initial clinical diagnoses was collected from their medical records. Data collection was done with the aid of structured forms (checklists) designed for the study. The diagnosis of cholelithiasis was based on clinical evaluation documented by doctors in the patient's case files. Further information was obtained by phone call.

4.10 Data processing and analysis

Completeness of the data was crosschecked and the data was coded and subsequently entered into Kobo Toolbox where it was stored and exported into SPSS version 22 software. Descriptive statistics was employed to the findings, utilizing tables, graphs, and charts. To assess the association between the outcome variable and independent variables, a binary logistic regression model was applied. The multivariable model was used to further examine the association between the outcome variable and the selected independent variables. Odds ratios, p-values, and 95% confidence intervals for odds ratios was utilized for testing significance and interpreting the results.Variables with a p-value less than 0.05 was considered statistically associated with the outcome variable.

4.11. Ethical considerations

The data collection was conducted after obtaining ethical clearance from the Institutional Review Board (IRB) of the College of Medicine and Health Sciences, Bahir Dar University, and the research ethics committee of Tibebe Gion Specialized Hospital .

Confidentiality was insured by refraining from recording patients' names, and the data were disclosed to third parties. Instead, medical record numbers was employed for data collection, and personal identifiers of the patients was included in the research report.

4.12. Dissemination

This study is conducted as partial fulfillments of the specialty certificate in General Surgery at Bahir Dar University. The findings will be reported to Tibebe Gion Specialized Hospital, will be input for planning and potential interventions. Efforts will be made to disseminate the findings to other stakeholders through the publication in accessible journals and presentations at conferences

5. Results

5.1. Socio-Demographic Characteristics

The majority of patients were females accounting for 119 (69.6%) a nd83(48.5 %) were in the age group between 40-60 years old. Additionally, 92(53.8%), came from Rural areas. See table 2

Table 2: Socio-demographic characteristics of patients who underwent open cholecystectomy in TGSH,2025(N= 171)

Variables		Frequency	Percentage
Sex	Female	119	69.6%
	Male	52	30.4%
Age	18-39	50	29.2%
	40-60	83	48.5%
	>60	38	22.2%
Residency	Rural	92	53.8
	Urban	79	46.2%%

14 patients had comorbidity among patients who underwent open cholecystectomy. The most common conditions were diabetes mellitus in 6 patients (3.5%), followed by asthma in 3 patient (1.8%), hypertension and HIV in 2 patient (1.2%) each and cardiac illness in 1 patient (0.6%) .

Regarding duration of illness at which patients presented, 117 patients (68.4%) had the illness for more than 30days prior to presentation. 42patients (24%) presented within 30 days after onset of symptom and 12(7%) patients presented within 7 days after onset of illness. (See fig 2)

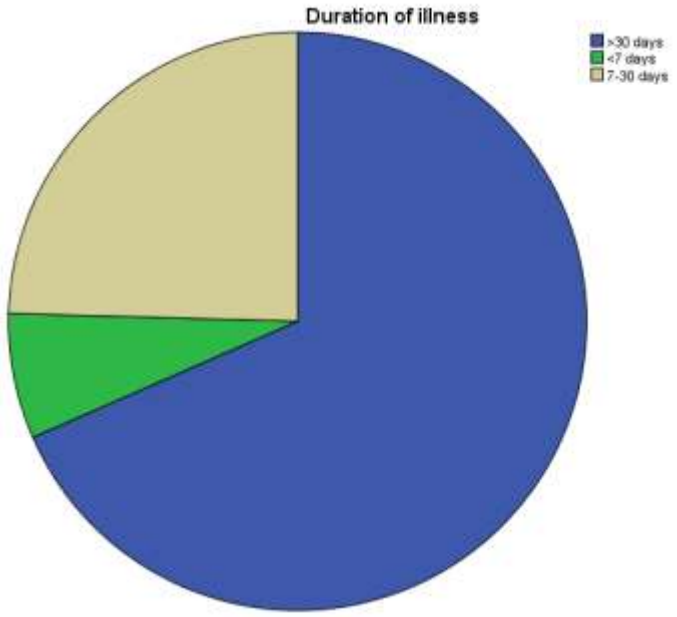

Figure 2: Duration of illness at presentation, of patients who underwent open cholecystectomy at TGSH, 2025(N =171).

Among the clinical presentations right upper quadrant pain was the most prevalent in 160 patients (93.6%), vomiting was reported in 39(22.8%) , loss of appetite was reported in 70 patients (40.9%) and bloating in 45 patients (26.3%) . Epigastric pain was noted in 51 (29.8%) of cases. Intermittent yellowish discoloration of the eyes in 14(8.2%) and fever was noted in 17 patients (9.9%) . See table 3

Table3: Frequency Distribution of Clinical Presentation of patients who underwent open cholecystectomy ,2025 at TGSH (N=171)

Symptoms[a]	Frequency	
RUQ_pain	160	93.6%
Vomiting	39	22.8%
Fever	17	9.9%
Bloating	45	26.3%
Loss_of_appetite	70	40.9%
Epigastric_pain	51	29.8%
Intermittent_yellowish_discoloration_of_eyes	14	8.2%

The preoperative imaging (abdominal ultrasound or CT Scan study) showed gallbladder stone in 132(77.2%). Complicated gallstone disease such as acute or chronic cholecystitits , perforated gallbladder, gallbladder empyma, gallstone pancreatitis in 33 patients(19.3%) . Imaging also showed gallbladder polyp in 1 patient, biloma in 2 patients and porceline gallbladder in 3 patients

144(84.2%) patients had elective open cholecystectomy and 27(15.8%) patients had open cholecystectomy on emergency basis. See fig 3

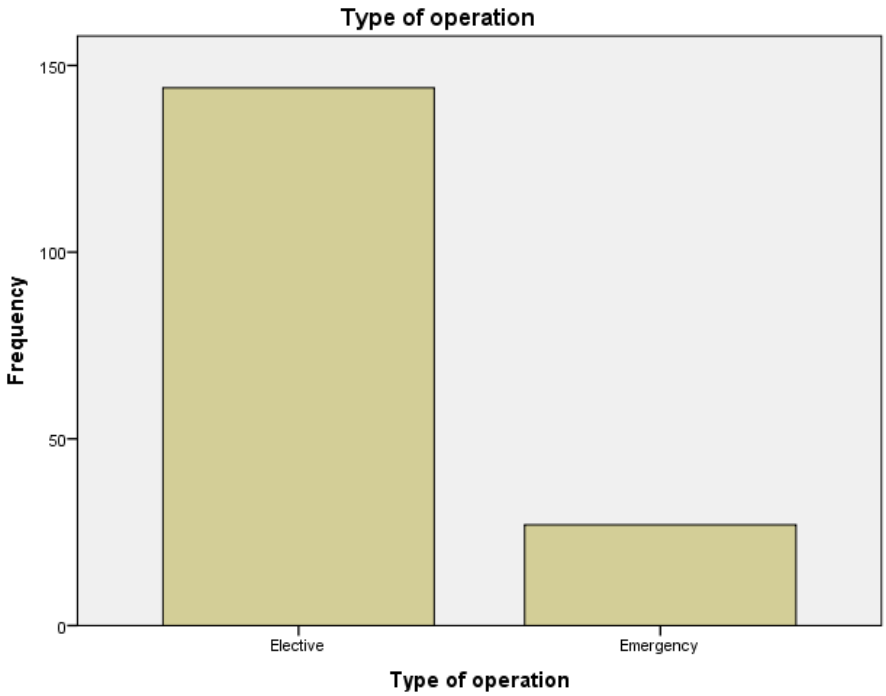

Figure 3: Type of surgery of patients who underwent open cholecystectomy at TGSH,2025 (N=171)

Intraoperatively gallbladder stone and inflamed gallbladder were the most common finding . Gallbladder stone was found in 158 patients (92.4%), inflamed gallbladder was found in 20(11.7%) and perforated gallbladder was found in 13 (7.6%) . Intraabdominal collection/biloma was found in 7 paitents(4.1%) , CBD stone and gallbladder empyma was found in 4 patients each . gangrenous gallbladder, gallbladder polyp , gallbladder pancreatitis and calcified gallbladder were found in 1 patient each

Majority(130) of the patients stayed in the hospital less than 4 days , 27 patients stayed in the hospital 4-7 days and 14 patients stayed in hospital more than 7 days. See table 4

Table 4: length of stay in hospital of patients who underwent open cholecystectomy in TGSH,2025 (N=171)

		Frequency	Percent
Length of stay in hospital	<4 days	130	76.0%
	>7 days	14	8.2%
	4-7 days	27	15.8%

Among biliary /procedure related complications, Superficial Surgical site infection(SSI) was most common ,encountered in 16 patients followed by post cholecytectomy syndrome which was reported in 10 patients. Biloma was reported in 3 patients, chronic post surgical pain was reported in 2 patients and retained stone was reported in 1 patient. Total of 32 postoperative biliary/procedure related complications were reported. None biliary complications include pneumonia in 3 patients and renal failure in 2 patients. These complications were classified based on Modifed Clavin-Dindo classification. Most complication fall into CD I, which was reported in 17 patients, 3 patients had complication that fall into CDII , two patients in CD III and 1 patient in CD V. See fig 4

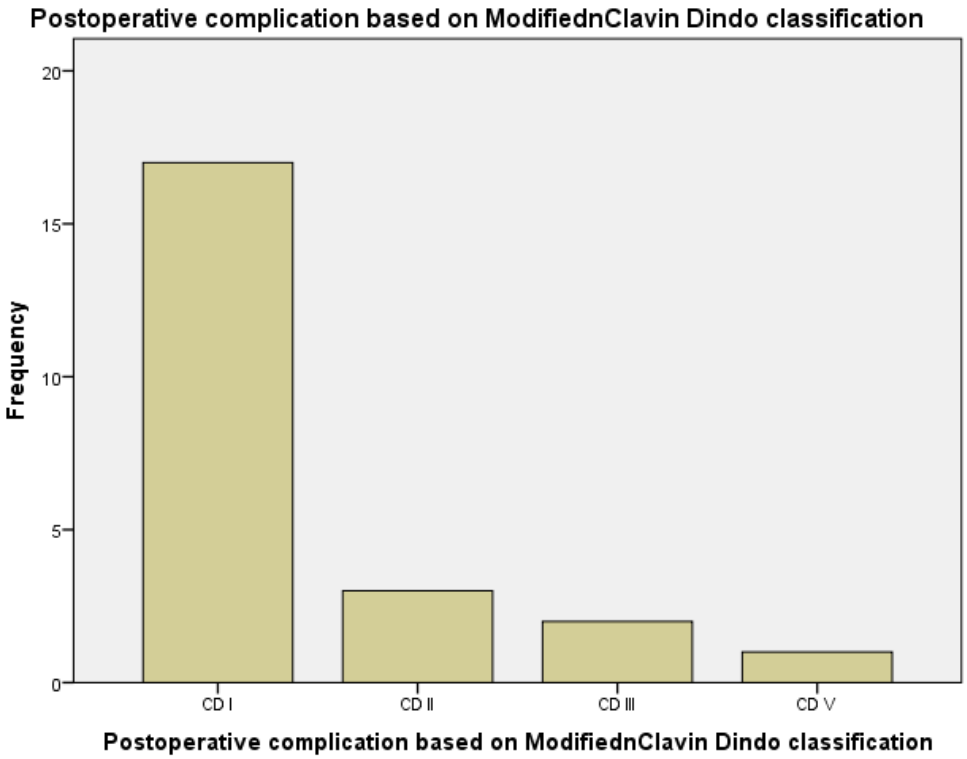

Figure 4-: postoperative complications based on Modified Clavin-Dindo classification of patients who underwent open cholecystectomy in TGSH.

The clinical outcomes of patients underwent open cholecystectomy were assessed three months postoperatively. Among the study subjects, 146 pateints(85.4%), exhibited a favorable outcome. Conversely, 25 patients (14.6%) demonstrated unfavorable outcome.

5.2Determinant factor of open cholecytectomy Outcome in Tibebe Ghion Specialized Hospital, Northwest Ethiopia,2025

In bivariable logistic analysis,open cholecystectomy outcome was associated with age, sex, residency, comorbidity, indication for open cholecystectomy, type of operation.
In multiple logistic regression, only type of operation (AOR= 0.047, 95% CI: 0.05-0.481, p=0.01), and residency of the patient (AOR=0.225, 95% CI: 0.05-0.887, p=0.033) had significant associations with unfavorable clinical outcomes. Patients operated in emergency basis were 0047

times less likely to have favorable outcome compared to patient operated in elective basis and patient from rural area were 0.225 times less likely to have favorable outcome compared to patient from urban area.

Table 5 Factors associated with unfavorable clinical outcome in patient who underwent open cholecytectomy at TGSH Bahir Dar northwest Ethiopia.(N=171)

		Clinical outcome		COR(95% CI)	p-value	AOR(95 %CI)	p-value
		Favorable	Unfavorable				
Sex	Female	107	12				
	Male	39	13	0.336	0.014		
Age				1.707	0.085		
Type of operation	Elective	137	7				
	Emergency	9	18	0.026	0.00	0.047(0.05-0.481)	0.01
Indication for operation				2.153	0.00		
Residency of patien	Urban	74	5				
	Rural	72	20	0.243	0.07	0.225(0.057-0.887)	0.033
Comorbidity	no	135	22				
	Yes	11	3	0.598	0.456		

6. Discussion

This cross sectional study involving 171who underwent open cholecystectomy, investigated various factors associated with the clinical outcomes of patients focusing on the comparison between favorable and unfavorable outcomes.
The study examined the clinical outcome and the association between factors, sociodemographic data, type of operation , indications for open cholecystectomy.. The outcome of patients who underwent open cholecystectomy was favorable in 146 (85.4%) and unfavorable in 14.6% of patients.

6.1 Clinical presentation and surgical outcome

In this study, majority of the patient were female (69.9%) and from rural area. Diabetics mellitus and hypertension were the most common comorbiditis. This was similar to study done in Saudi Arabia where majority of the patient(68.22) were females (34). Another study showed 66.9% of patients were female(35). DM and hypertension were also the most comorbidities reported (34, 36).

The common presenting features right upper quadrant pain(biliary colic), epigastric pain, bloating, loss of apptite and vomiting . In this study, right upper quadrant pain (biliary colic), loss of appetite and epigastric pain were the most common symptoms reported. Study done in Korea (2015) showed that right upper quadrant pain and epigastric pain was the most common presentation(34, 37).

In this study, abdominal ultrasound /CT showed gallbladder stone in 132(77.2%) and Complicated gallstone disease such as acute or chronic cholecystitits , perforated gallbladder, gallbladder empyma, gallstone pancreatitis) in 33(19.3%) of patients. Study done in Sweden showed that gallstone is the most common finding (35, 38).

Our study showed that intraoperative findings included gallbladder stone was found in 158 (92.4%) of the patients, inflamed gallbladder was found in 20 (11.7%), and perforated

gallbladder was found in 13 patients(7.6%) . Intraabdominal collection/biloma was found in 7(4.1%), CBD stone and gallbladder empyma was found in 4 patients each . gangrenous gallbladder, gallbladder polyp , gallstone pancreatitis and calcified gallbladder were found in 1 patient each.

Total of 32 postoperative biliary/procedure related complications and 5 systemic /non biliary related complications were reported. Superficial Surgical site infection (SSI) was the most common complication encountered in 16 patients(9.4%) followed by postcholecytectomy syndrome which was reported in 10 patients(5.8%). Study done in India(39) showed SSI of 2.26% and study done in Croatia showed SSI of 6.6%(40).

Incidence of postcholecystectomy syndrome from different studies ranges from 5–47% (41) Study done in USA showed mortality rate after open cholecystectomy was 2.9%(32)But in our study mortality rate was 0.5%.

Usefulness of MCDC in reporting surgical complication was mentioned in various studies. Study done in Pakistan Comparing of Postoperative Complications of Open Versus Laparoscopic Cholecystectomy According to the Modified Clavien-Dindo Classification System(42).

IN our study, with multivariate analysis, two of the factors (type of operation and residency of the patient) were found to be independent predictors of unfavorable outcome in our study population. Emergency open cholecystectomy was associated with unfavourable outcome. Similar result was observed in study done in UK. The retrospective study done in UK showed emergency cholecytectomy is associated with higher odds of negative outcomes compared to elective surgery (OR = 2.73, $p < 0.05$)(43).

Another study done in UK showed emergency cholecystectomy has higher postoperstive mortality (44). It also showed emergency cholecystectomy is associated with postoperative complication and prolonged hospitalization(44)

Patient from rural area had unfavourable outcome in our study (AOR=0.225, 95% CI: 0.05-0.887, p=0.033). This deviate from study done in New Zealand which showed both patient from rural and urban areas had similar outcome (45)

Our study has revealed a predominant trend towards favorable outcome in the majority of patients 146 (85.4%). Notably, patients who underwent emergent open cholecystectomy and patient from rural area were prone to unfavorable outcomes as seen.
This study assumes particular importance in the context of limited existing research on surgical outcomes of open cholecystectomy in developing countries, such as Ethiopia.

7. Limitation and strength of study

A retrospective chart review, has inherent limitations, including potential data inaccuracies and missing informations. The study lacks comprehensive insights into other factors that affect outcomes in open cholecystectomy.

Despite the retrospective nature, the data collection spanned a 2-year period, offering valuable observations regarding open cholecystectomy
This study assumes particular importance in the context of limited existing research outcomes of open cholecytectomy in developing countries, such as Ethiopia. The insights derived from our findings can contribute to more accurate stratification of morbidity resulted from open cholecystectomy.

8. Conclusion

Our study has revealed a predominant trend towards favorable outcome in the majority of patients 146(85.4%). Notably, patients undergoing emergency open cholecytectomy and patient from rural area haveunfavorable outcomes as seen in 14.6% of cases. Open cholecytectomy is invasive procedure with significant morbidity and prolonged hospital stay.

9. Recommendations

The study on outcome of open cholecystectomy underscores the need for improvement in healthcare accessand Increased awareness among healthcare providers for rural areas in Amhara region. These can be archived by collaboration of Amhara regional health bureau and Amhara region admistrativeoffice .

Promptand ontimemanagement of patients who present on emergency basis is needed.

Stratification of postoperative complication based onModified ClavinDindoclassification isuniform way of reporting negative outcomes after surgery and can facilitate comparision of outcome between different centers.

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11. ANNEX

Annex 1: general information sheet

Principal investigator name; Dr.RebecaShimelis,, final year surgery resident. Department of surgery in Bahir Dar University, College of medicine and health Science. Conducting a study on outcome and determinant of open cholecystectomy in Tibebe Gion specialized hospital.

Address, Cell phone, 0941368859. E-mail; beckyshimelis86@gmail.com

Name of the data collector _____ Signature_____Date_____

Date of the data collected_____

Name of the supervisor _____ Signature. _____Date_____

Annex 2: Checklist 001. Checklist Code_____

1. Sex A. Male B. Female

2. Age in year's A. 18-39 B 40-60 C. >60

3. Residency of the patient A. urban B. rural

5. Comorbidity present 1. Yes 2 no

6. If your answer for question no.15 is yes, which co morbidity?

A. Diabetes mellitus B. Hypertension C. Cardiac disease D. kidney failure E.asthmaF. HIV

7. Symptoms at presentation

A. RUQ pain 1.yes 2.no

B. vomiting 1.Yes 2.no

C.loss of apptite 1. Yes 2.no

D.Intermitent yellowish discoloration of eyes 1.Yes 2.no

F. bloating 1.yes 2.no

H. Epigastric pain 1.yes 2.No

8. Duration of symptoms A. <7days B. 7-30 days c.>30 days

9. Previous abdominal surgery A.yes B. No

10. Imaging

Ultrasound /CT finding

A.cholelithiais B. Choledocholithiasis C. Gallbladder polyp

D.Porceline gallbladder E intraabdominal collection

12. Indication for open cholecystectomy?

A. biliary colic

B. complicated gallstone disease((Acute cholecystits ,gallbladder perforation.Chroniccholecystitis, gallbladder empyma, Porceline gallbladder)

C, Gallbladder polyp

D. Porceline gallbladder

13. Type of open cholecystectomy. A. emergency B. Elective

14. Intraoperative finding

A . Gallbladder stone 1. Yes 2. No

B. Choledocholithiasis 1. Yes 2. No

C. Gangrenous gallbladder 1.yes 2.no

D. Perforated gallbladder 1.yes 2.no

E. inflamed gallbladder 1.yes 2.No

F. gallbladder empyma 1,yes 2 no

G.gallstonepancreatites

H.Calcified Gallbladder 1.yes 2.no

15. Preoperative antibiotics used 1. Yes 2. No

16. Length of hospital stay

A.<4days B. 4-7 days C. >7days

17. Post operative complication present 1.yes 2. No

If yes

procedure related complications

A. SSI 1.yes 2. No

B. retained stone 1.yes 2. No

C. chronic surgical site pain 1.yes 2.no

D. post cholecystectomy syndrome 1.yes 2. No

E. B ile duct injury 1.Yes 2. No

Systemic complication

A.pneumonia

B.DVT

C.Renal failure

D.cardiac failure

18. Post operative complication based on Modified Clavien-Dindo classification

A. CD I

B.CD II

C. CD III

D. CD IV

E.CD V

Thank you