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An observational study on spectrum of complications in gallstone disease in Western Maharashtra

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Abstract. Gallbladder calculus prevalence exhibits significant regional disparities, affecting public health. This study aimed to assess the incidence of complications in diagnosed cases of gallbladder stones using a prospective observational approach. Methods encompassed comprehensive history-taking, clinical examinations, imaging, and biochemical markers' analysis. In this study encompassing 238 cases of symptomatic gallstones, a comprehensive analysis revealed that 31.9% of patients presented with complications. Among these, choledocholithiasis emerged as the most prevalent complication, affecting 13.45% of the cases. Acute cholecystitis and gallstone pancreatitis were also significant complications, occurring in 10.9% and 6.7% of the cases, respectively. Noteworthy is the consistent alignment between clinical diagnoses and imaging findings, highlighting the accuracy and reliability of the diagnostic process. Turning to the exploration of management modalities, the data showcased laparoscopic cholecystectomy as the predominant surgical intervention. Both early and delayed laparoscopic cholecystectomies were frequently performed, reflecting the versatility of this approach in addressing symptomatic gallstone cases. However, it is essential to note that an overall 6% conversion rate from laparoscopic to open cholecystectomy was observed, underscoring the importance of adaptability in surgical strategies. These findings not only contribute to a deeper understanding of the prevalence and complications associated with symptomatic gallstones but also emphasise the significance of accurate diagnostic measures and the need for surgical flexibility in managing these cases.

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The results presented in this study offer valuable insights that can inform clinical decision-making and enhance the overall management of patients presenting with symptomatic gallstones

Keywords: laparoscopic cholecystectomy; choledocholithiasis; gallbladder calculus; open cholecystectomy; acute cholecystitis

Introduction

Gallstone disease poses a significant global public health challenge, demanding an in-depth understanding of its complications for optimizing patient care. Recent global research has contributed valuable insights into various facets of gallstone disease complications; however, there remains a gap in localised investigations, particularly within the unique demographic of Western Maharashtra. S. Mukai *et al.* [1] extensively explored urgent interventions, focusing on the timely management of complications. Their work sheds light on the critical decision-making processes in emergency scenarios, emphasizing the need for prompt medical attention. However, their study primarily delves into the acute aspects, leaving room for further investigation into the broader spectrum of complications that may unfold over time. M. Di Martino *et al.* [2] investigated the optimal timing of cholecystectomy in gallstone disease cases. Their findings underscore the importance of strategic planning for surgical interventions, particularly in preventing recurrent complications. While their research contributes significantly to the understanding of cholecystectomy timing, there is still a need to explore the diverse complications that may necessitate different intervention timelines. M. Zhu *et al.* [3] delved into causal associations in gallstone disease, examining the factors that contribute to the development of complications. Their work highlights the multifaceted nature of the disease, linking various risk factors to specific complications. However, a comprehensive understanding of the entire spectrum of complications within a specific population, such as Western Maharashtra, is yet to be explored. P.S. Kumar & S. Harikrishnan [4] explored unusual complications of gallstone disease, providing insights into less common manifestations. Their work broadens the scope of understanding beyond typical complications, offering crucial information for clinicians. However, their focus on unusual complications necessitates further investigation into the more prevalent complications within the Western Maharashtra demographic. N.Y. Cho *et al.* [5] contributed to the understanding of gallstone disease complications, emphasizing the significance of tailored approaches to patient care. Their research underscores the need for personalised strategies based on patient demographics and characteristics. Nevertheless, their study primarily focuses on general considerations, warranting a specialised investigation into the unique complications prevalent in Western Maharashtra. M. Lodha *et al.* [6] provided insights into specific complications in gallstone disease, contributing to the overall knowledge base. Their work offers valuable perspectives on the complexities of managing particular complications.

However, a comprehensive analysis encompassing the entire spectrum of complications specific to Western Maharashtra is yet to be undertaken. This study aimed to comprehensively analyse the spectrum of complications associated with gallstone disease in the unique demographic of Western Maharashtra through a single-centre approach.

Materials and Methods

In this prospective observational study, conducted at a tertiary care centre in Western Maharashtra, a total of 238 patients with symptomatic gallstone disease and its complications, admitted to the hospital between January 2021 and January 2023, were included, excluding those with asymptomatic gallstone disease and primary choledocholithiasis. On admission, detailed history and clinical examination findings were recorded. In history, pain in the abdomen, dyspepsia, vomiting, fever, abdominal distension, and features of jaundice were recorded. In clinical examination, presence of right upper quadrant (RUQ) tenderness, Murphy's sign, rebound tenderness/guarding, palpable liver/gall bladder and ascites were documented.

Upon admission, all patients underwent biochemical evaluation, including serum bilirubin, liver enzymes (including Serum Aspartate Transaminase, Alanine Transaminase, Serum Alkaline Phosphatase, and Gamma Glutamyl Transferase), and pancreatic enzyme assay. These investigations were conducted using an automatic biochemistry analyser employing spectrophotometric techniques. Normal laboratory values were as follows: Alanine Transaminase: 4 to 36 IU/L, Aspartate Transaminase: 5 to 30 IU/L, Alkaline Phosphatase: 30 to 120 IU/L, Gamma-Glutamyl Transferase: 6 to 50 IU/L, Bilirubin: 2 to 17 μmol/L, Direct Bilirubin: 0 to 6 μmol/L, Pancreatic amylase up to 85 IU/L and Pancreatic lipase up to 160 IU/L were considered normal.

All patients underwent an ultrasound (USG) abdomen in the radiology department and findings were recorded. Evaluation with advanced imaging techniques, including contrast-enhanced computed tomography (CECT) abdomen (if indicated), magnetic resonance cholangiopancreatography (MRCP) (if indicated), and endoscopic retrograde cholangiopancreatography (ERCP) (if indicated) were also performed.

The diagnosis of complications was established through a combination of clinical findings, imaging results, and biochemical markers. The study specifically addressed complications related to the location of the stone, encompassing gall bladder complications such as acute cholecystitis, Mirizzi Syndrome, mucocele, abscess-empyema, and gallbladder perforation; common bile duct complications including choledocholithiasis, obstructive jaundice, gallstone pancreatitis, and cholangitis; and intestinal complications, specifically gallstone ileus.

Logistic regression was employed to identify factors associated with specific complications, providing a quantitative assessment of the impact of variables while considering potential confounding factors. The coordination between diagnostic methods embraced a multidisciplinary framework, fostering close collaboration among clinicians, radiologists, and gastroenterologists. Through regular meetings and discussions, each specialist contributed their unique insights, facilitating a holistic interpretation of findings. The study protocol adheres to national ethical guidelines for biomedical and health research involving human participants according to the Declaration of Helsinki [7], as well as the Guidelines for Good Clinical Practice. Prior to participation, informed consent was obtained from all individuals involved. Approval for the study was obtained from the Institution Ethics Committee, ensuring compliance with ethical standards throughout the research process.

Results

Varied patterns across patient groups. The study population encompassed a diverse range of age groups, providing a comprehensive perspective on the prevalence of gallstone disease across various life stages (Table 1).

Table 1. Frequency table for age distribution

Age Group	Frequency	Percent
<= 20	4	1.7
21-30	45	18.9
31-40	55	23.1
41-50	56	23.5
51-60	38	16.0
61-70	30	12.6
71+	10	4.2
Total	238	100.0

Source: compiled by authors

The majority of participants fell within the middle-aged brackets, with notable representation from individuals aged 31 to 60. Specifically, individuals in the age group of 41 to 50 constituted the largest proportion, comprising 23.5% of the total cases. Moreover, participants aged 21 to 40 collectively accounted for approximately 43% of the study cohort, emphasizing the significance of gallstone disease within the adult population. Notably, the study included a considerable number of participants aged 60 and above, with individuals in the age group of 61 to 70 representing 12.6% of the total cases. This broad age distribution ensures a holistic understanding of the implications and variations in gallstone disease prevalence across different generational segments.

Varied presentations in patients with gallstone disease. The study meticulously documented the symptomatic manifestations among participants diagnosed with gallstone disease (Table 2).

Table 2. Presenting symptoms and its frequency

Symptoms (N=238)	Pain abd.	Dyspepsia	Vomiting	Fever	Abd. distension	Yellowing of eyes	High colour urine	Clay coloured stools	Pruritis
Frequency	208	67	123	35	1	14	15	10	3
Percentage	87.4	28.2	51.7	14.7	0.4	5.9	6.3	4.2	1.3

Source: compiled by authors

The predominant symptom reported was pain in the abdomen, with a staggering 87.4% of individuals experiencing this discomfort. Dyspepsia, characterised by indigestion or discomfort after eating, was noted in 28.2% of cases, highlighting its significant prevalence. Vomiting, a common symptom associated with gallstone-related complications, was reported by 51.7% of participants. Fever, a potential indicator of an inflammatory response, was observed in 14.7% of cases. Interestingly, abdominal distension, indicative of bloating, was relatively rare, reported by only 0.4% of individuals. Yellowing of the eyes was observed in 5.9% of cases, while high colouration of urine, often associated with liver or gallbladder disease, was noted in 6.3% of individuals. Clay-coloured stools, a potential sign of common bile duct obstruction, were reported by 4.2% of participants. Pruritis, or itching, was a less common but noteworthy symptom, observed in 1.3% of cases.

Diverse clinical presentations in gallstone disease. The clinical examination findings among participants diagnosed with gallstone disease were comprehensive, revealing several distinctive signs indicative of gallbladder and hepatobiliary complications (Table 3).

Table 3. Clinical signs

Clinical signs (N=238)	RUQ tenderness	Murphy's sign	Rebound/ Guarding	Hepatomegaly	Palpable GB	Ascites
Frequency	112	25	26	4	3	0
Percentage	46.67	10.42	10.83	1.67	1.25	0.00

Source: compiled by authors

RUQ tenderness was a prevalent clinical sign, observed in 46.67% of cases, highlighting the localised discomfort often associated with gallstone-related issues. Murphy's sign, a physical examination technique utilised to assess for gallbladder inflammation, was positive in 10.42% of individuals, providing further evidence of gallstone-related pathology. Rebound tenderness or guarding, indicative of peritoneal irritation, was noted in 10.83% of cases, suggesting the potential involvement of surrounding structures. Hepatomegaly, was observed in 1.67% of participants, while a palpable gallbladder, a less common but significant finding, was noted in 1.25% of cases. The absence of ascites further emphasised the localised nature of the clinical signs associated with gallstone disease.

Varying rates among gallstone patients. The majority of individuals, constituting 68.5% of the cohort (N=238), did not manifest any complications related to gallstones. Conversely, 19.7% of participants (N=238) experienced a single complication, underscoring the diversity in clinical presentations associated with gallstone disease (Table 4).

Table 4. Frequency and percentage of complications

Complication	Frequency	Percentage
No (N=238)	163	68.5
One (N=238)	47	19.7
More than One (N=238)	29	12.2
Two (N = 29)	21	72.4
Three (N = 29)	6	20.7
Four (N = 29)	0	0.0
Five (N = 29)	2	6.9

Source: compiled by authors

Furthermore, a subset of individuals, comprising 12.2% of the total cases (N=238), presented with more than one complication. Among those with multiple complications (N=29), a detailed breakdown revealed that 72.4% exhibited two complications, 20.7% had three complications, and 6.9% presented with five complications (Table 4). Notably, no individuals within this subset displayed four complications, highlighting the variability in the combinations and severity of complications associated with gallstone disease. In summary, this comprehensive categorization sheds light on the frequency and diversity of complications in individuals diagnosed with gallstone disease, providing valuable insights into the complexity of clinical presentations and the potential challenges in managing multifaceted cases.

Diverse issues in symptomatic gallstone disease cases. The study meticulously examined the prevalence of specific complications associated with gallstone disease, providing a detailed breakdown of individual complications and their corresponding frequencies. Acute cholecystitis was present in 26 individuals, accounting for 10.92% of the study population, while empyema was observed in 6 cases, representing 2.52% of the participants. Mucocele was documented in 14 individuals, constituting 5.88% of the cohort, and Common bile duct calculus (CBD calculus) was noted in 32 cases, indicating a prevalence of 13.45%. Cholangitis was identified in 6 individuals, making up 2.52% of the study population, and surgical obstructive jaundice (SOJ) was seen in 12 cases, with a prevalence of 5.04%. Gallstone Pancreatitis was present in 16 individuals, representing 6.72% of the cohort, while Mirrizi's syndrome was documented in 5 cases, accounting for 2.10% of the participants. Notably, gallstone ileus was not observed in any individuals within the study population, indicating a zero prevalence (Table 5).

Table 5. Complications associated with gallstone disease

Complication	Ac. cholecystitis	Empyema	Mucocele	CBD calculus	Cholangitis	SOJ	Gallstone pancreatitis	Mirrizi's syn	Gallstone ileus
Frequency	26	6	14	32	6	12	16	5	0
Prevalence / 100 (%)	10.92	2.52	5.88	13.45	2.52	5.04	6.72	2.10	0.0

Source: compiled by authors

These findings offer a comprehensive understanding of the distribution of specific complications associated with gallstone disease, shedding light on the varied clinical presentations, and highlighting the relative frequencies of each complication within the studied cohort.

Addressing gallstone disease complications effectively. In this study, all 238 patients were offered surgical treatment. All patients are offered either an upfront surgery or conservative management with or without ERCP followed by surgery (Fig. 1).

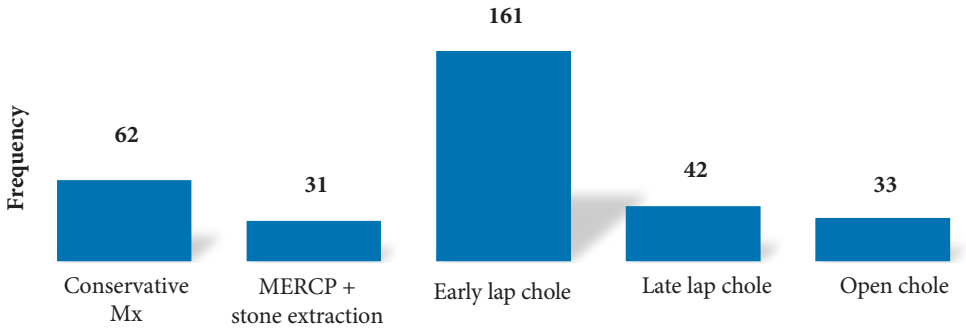

Figure 1. Management modalities

Source: compiled by authors

Out of 238 patients, 236 underwent cholecystectomies and 2 patients did not report back after conservative management. In patients who underwent surgery, 216 cases were taken up for laparoscopic cholecystectomy. Out of which, 203 cases (86%) successfully underwent laparoscopic cholecystectomy (LC) and 13 cases were converted to open cholecystectomy (OC) [conversion rates were 6%]. A total of 33 cases (14%) underwent open cholecystectomy. In the laparoscopic group, 161 cases (79.3%) underwent Laparoscopic cholecystectomy during the same admission. 42 cases (20.7%) underwent Laparoscopic cholecystectomy after a period of 4 weeks.

Acute cholecystitis. There were a total of 26 cases of acute cholecystitis in this study. All cases were managed conservatively, initially followed by surgery. Out of 26 cases, 20 cases (76.9%) underwent Lap cholecystectomy and 6 cases (23.1%) underwent open cholecystectomy (includes 2 cases of lap converted to open cholecystectomy).

Choledocholithiasis + acute cholangitis + obstructive jaundice. There were a total of 32 cases of CBD calculus in this study. Of 32 cases, 12 cases had associated obstructive jaundice and 6 cases had associated acute cholangitis. All cases were managed conservatively and subjected to ERCP. Out of this, 31 cases underwent Endoscopic papillotomy and stone extraction. The procedure was successful in 28 cases (90.3%) and failed in 3 cases (9.7%). All 32 cases underwent cholecystectomy, the distribution of which is mentioned in the Figure 2. 3 cases underwent early laparoscopic cholecystectomy, 17 cases underwent delayed laparoscopic cholecystectomy and 12 cases underwent open cholecystectomy with/without a drainage procedure.

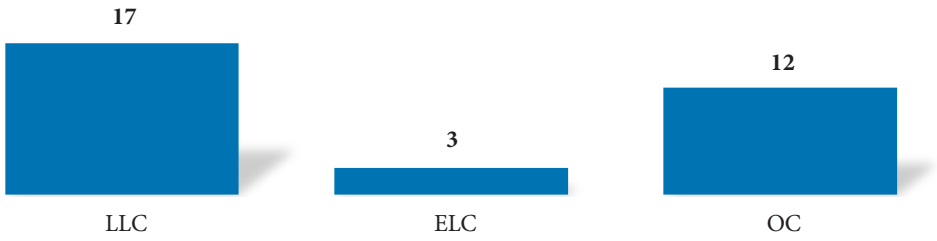

Figure 2. Surgery in CBD calculus

Source: compiled by authors

Gallstone pancreatitis. In this study, there were a total of 16 cases of gallstone pancreatitis. All cases underwent conservative management followed by one of the surgical procedures. Out of 16 cases, 12 cases underwent delayed laparoscopic cholecystectomy, 2 cases underwent open cholecystectomy and 2 cases did not report back to this centre after conservative management.

Mirizzi syndrome. In this study, there were 5 cases of Mirizzi syndrome, out of which 3 patients underwent laparoscopic cholecystectomy, and 2 patients underwent open cholecystectomy.

Empyema. There were a total of 6 cases (2.52%) of empyema in this study. Most of the cases underwent early lap cholecystectomy (83%) and one case underwent open cholecystectomy.

Mucocele. A total of 14 cases of mucocele had been observed in this study. 50% of the cases (7) underwent early lap cholecystectomy and 50% (7) underwent late lap cholecystectomy.

Imaging findings: comprehensive insights into gallstone disease complications. In this study, all 238 patients had undergone Imaging in form of ultrasound abdomen after the initial assessment and clinical diagnosis. This was followed by CECT abdomen/MRCP/ERCP as per the ultrasound findings and requirement of the case. In 85.3% of cases (N=203), the clinical diagnosis had been confirmed by imaging diagnosis. In the rest, 14.7% of cases (N=35), the imaging diagnosis differed from the clinical diagnosis.

The study, involving 238 patients with gallstone disease complications in Western Maharashtra, revealed a diverse demographic, with the majority aged 31 to 60. Abdominal pain was the predominant symptom, while clinical signs such as RUQ tenderness and Murphy's sign varied. Complication prevalence highlighted the complexity of cases, with 68.5% exhibiting no complications and 12.2% presenting with more than one. Specific complications, including acute cholecystitis and CBD calculus, were prevalent, while imaging methods confirmed clinical diagnoses in 85.3% of cases. In terms of management, all patients were offered surgical treatment, with laparoscopic cholecystectomy emerging as the primary surgical approach. These findings underscore the multifaceted nature of gallstone disease and provide essential insights into patient characteristics and treatment methods, bridging the gap between clinical and instrumental diagnostic approaches.

Discussion

The study aligns with the emphasis put by S. Mukai *et al.* [1] on the centrality of pain in the abdomen (87.4%) in diagnosing gallstone-related conditions, highlighting the consistency and reliability of this symptom. The study is consistent with the opinion of M. Lodha *et al.* [6], reinforcing the significance of pain in the abdomen in diagnosing gallstone-related conditions. Both studies contribute to the understanding of clinical profiles and outcomes in symptomatic gallstone disease. The study contrasts with the advocacy provided by N.Y. Cho *et al.* [5] for early intervention within 72 hours. The discordance emphasises the influence of institutional factors and patient profiles on treatment decisions, highlighting the need for a personalised approach in gallstone disease management.

The study supports Mendelian randomization study by Q. Zhu *et al.* [3], emphasizing the strong correlation between metabolically-abnormal obesity and gallstone disease. Both studies contribute to the understanding of the multifaceted nature of gallstone development. This study is consistent with the findings by P.Y. Su *et al.* [8] and W. von Schönfels [9], adding insights into the association between metabolic factors and gallstone pathogenesis. However, this study did not address the postoperative complications in patients with metabolic abnormalities and their management, as highlighted by A. Paro *et al.* [10].

The study aligns with the focus of F. Roesch-Dietlen *et al.* [11] on the safety of laparoscopic subtotal cholecystectomy, providing insights into the surgical approach. Both studies contribute valuable information on surgical considerations [7]. However, the study contrasts with the advocacy by K. Okamoto *et al.* [12] and N.Y. Cho *et al.* [5] for early intervention within 72 hours, indicating the diversity in approaches and the complexity of decisions in gallstone disease management.

The results of the study mirror the report by C. Zhang *et al.* [13] and S.M. Staubli *et al.* [14] on the efficacy of endoscopic management in the treatment of cholecystolithiasis. The high success rate in this study reaffirms the role of endoscopic procedures in managing gallstone-related complications. This study aligns with the exploration by G.A. Bass *et al.* [15] and S.B. Kim *et al.* [16] of long-term outcomes of acute acalculous cholecystitis and in patients over 65 years of age treated by non-surgical management. Both studies contribute insights into the management of gallstone-related complications. The investigation aligns with the assessment of G. Janjic *et al.* [17] of early vs. delayed laparoscopic cholecystectomy for acute cholecystitis, contributing to understanding the optimal timing of surgical interventions.

This study does not provide specific details on the comparison between ERCP vs. Surgery for choledocholithiasis and clinical application of enhanced recovery after surgery in the treatment of choledocholithiasis. Additional information on this could have facilitated a meaningful comparison [16, 17]. In this study, ERCP is done predominantly for all CBD calculus, whereas the study performed by F.C. Schacher *et al.* [18] did not find any difference in outcomes of patients who underwent ERCP or lap interventions. This study participants underwent laparoscopic cholecystectomy as the commonly performed procedure, but the study did not follow the enhanced recovery after surgery protocol (ERAS) which could have added more information on its impact on surgical outcomes. Y. Zhang *et al.* [19] documented better outcomes of patients following ERAS before surgery. Further, this study did not contribute much to the aetiology of acute pancreatitis and its endoscopic management and timing of surgery, areas explored by P. Szatmary *et al.* [20]. The role of safe anaesthesia and infection control practices during cholangioscopy and pancreatoscopy was not discussed in detailed as documented by Sanders et al. where the necessity of routine duodenoscopy, endoscopic ultrasound and propofol as a safe anaesthetic agent was documented [20].

The results of this study align with the systematic review and meta-analysis by D.J. Sanders *et al.* [21] and with the study by W.K. Peng *et al.* [22], and the study by M. Johnstone [23], contributing to the understanding of the role of laparoscopic cholecystectomy in the management of gallstone-related complications, the timing of surgery, and postoperative outcomes. All these studies add valuable insights into surgical approaches. The study successfully elucidated key demographic patterns, predominant clinical presentations, and prevalent complications associated with gallstone disease. Notably, these findings revealed a higher prevalence of gallstones in females, aligning with global literature trends [21, 22]. Choledocholithiasis emerged as

the most common complication, underscoring the clinical significance of secondary bile duct stones in gallstone patients [22, 23]. The imaging-based approach, including ultrasound and additional modalities as needed, provided a reliable confirmation of clinical diagnoses in the majority (85.3%) of cases. Furthermore, the study shed light on the treatment patterns, with laparoscopic cholecystectomy being the preferred approach, complemented by timely interventions for specific complications like choledocholithiasis.

Conclusions

In conclusion, this qualitative study was conducted at a tertiary care centre in Western Maharashtra with the primary aim to comprehensively explore the spectrum of complications in gallstone disease. The study successfully achieved its objectives by analysing the incidence of complications, comparing clinical and imaging diagnoses, and examining various management modalities.

The predominant age group was 31 to 60, with abdominal pain identified as the leading symptom. 12.2 % of study participants had specific complications, including acute cholecystitis, CBD calculus, and gallstone pancreatitis, demonstrated varying prevalence rates. The study emphasised the multifaceted nature of gallstone disease, with a majority of patients not exhibiting complications up to 65%, but a subset presenting with multiple complications. The confirmation rate of clinical diagnoses through imaging is 85 %, emphasizing the crucial role of imaging modalities in enhancing diagnostic accuracy and guiding appropriate treatment strategies. Laparoscopic cholecystectomy emerged as the predominant surgical intervention, conducted in 86% of cases, highlighting its widespread acceptance and efficacy in managing gallstone-related complications. However, 6% of laparoscopic cholecystectomies required conversion to open cholecystectomy, indicating challenges encountered during the procedure. Long-term follow-up data and regional variations can be incorporated for a more comprehensive understanding of gallstone disease.

Moving forward, the prospects for further research include expanding the study to a more diverse and larger population to enhance generalizability. Additionally, future research could delve into refining diagnostic and management strategies, contributing to ongoing efforts to optimise patient care.

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None.

Conflict of Interest

The authors declare no conflict of interest.

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Спостережне дослідження спектру ускладнень у хворих на жовчнокам'яну хворобу в Західній Махараштрі

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Анотація. Вивчення поширеності каменів у жовчному міхурі сприяло виявленню значних регіональних розбіжностей, що впливають на громадське здоров'я. Дане дослідження було спрямовано на оцінку частоти ускладнень у діагностованих випадках каменів у жовчному міхурі з використанням проспективного спостережного підходу. Методи включали комплексне збирання анамнезу, клінічні обстеження, обстеження та аналіз біохімічних маркерів. У цьому експерименті, що охоплював 238 випадків симптоматичних каменів у жовчному міхурі, комплексний аналіз показав, що 31,9 % пацієнтів мали ускладнення. З них найбільш поширеним ускладненням був холедохолітіаз, який виявлявся у 13,45 % випадків. Гострі жовчнокам'яні холецистит та панкреатит також були значними ускладненнями, які виявлялися у 10,9 % та 6,7 % випадків відповідно. Важливою є послідовність між клінічними діагнозами та результатами обстежень, що підкреслює точність і надійність діагностичного процесу. Щодо дослідження методів лікування, дані продемонстрували лапароскопічну холецистектомію як переважне хірургічне втручання. Часто виконувалися як ранні, так і відстрочені лапароскопічні холецистектомії, що відображає універсальність цього підходу у лікуванні симптоматичних випадків жовчнокам'яної хвороби. Однак важливо зазначити, що загальний коефіцієнт конверсії від лапароскопічної до відкритої холецистектомії становив 6 %, що підкреслює важливість адаптивності в хірургічних стратегіях. Ці результати не лише допомагають глибше зрозуміти поширеність та ускладнення, пов'язані з симптоматичними каменями у жовчному міхурі, але й підкреслюють значення точних діагностичних заходів та необхідність хірургічної гнучкості у вирішенні цих випадків. Представлені в цьому дослідженні результати надають цінні висновки, які можуть бути корисними для клінічного прийняття рішень та покращенні ведення пацієнтів із симптоматичними каменями у жовчному міхурі

Ключові слова: лапароскопічна холецистектомія; холедохолітіаз; камені жовчного міхура; відкрита холецистектомія; гострий холецистит