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EVOLVING PARADIGMS IN THE MANAGEMENT OF CHOLECYSTITIS: AN EVIDENCE-BASED REVIEW

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ABSTRACT

Cholecystitis, an inflammatory condition of the gallbladder, continues to represent a significant clinical burden globally due to its association with gallstone disease and potential for serious complications. Contemporary management has undergone a paradigm shift from traditional delayed surgical approaches to early, evidence-based, multidisciplinary strategies. Advances in imaging, antimicrobial stewardship, minimally invasive surgery, and interventional radiology have refined diagnostic accuracy and therapeutic outcomes. Early laparoscopic cholecystectomy is now considered the gold standard for most patients, while alternative modalities such as percutaneous cholecystostomy and endoscopic gallbladder drainage have gained prominence in high-risk or non-operative candidates. Emerging evidence emphasizes individualized care based on disease severity, patient comorbidities, and resource availability. Furthermore, updated clinical guidelines advocate for severity grading systems and targeted antimicrobial therapy to optimize outcomes and reduce complications. This review synthesizes current evidence on evolving management strategies, highlighting innovations, clinical decision-making frameworks, and future directions in cholecystitis care. The integration of surgical and non-surgical modalities underscores the transition toward precision-based management in modern hepatobiliary practice.

KEYWORDS: Cholecystitis; Gallstones; Laparoscopic cholecystectomy; Evidence-based medicine; Percutaneous cholecystostomy; Endoscopic drainage; Antibiotic therapy; Tokyo guidelines; Minimally invasive surgery; Gallbladder inflammation.

INTRODUCTION

Cholecystitis is defined as inflammation of the gallbladder, most commonly resulting from obstruction of the cystic duct by gallstones, leading to bile stasis and secondary infection.[1] Acute cholecystitis accounts for a substantial proportion of emergency surgical admissions worldwide and is associated with significant morbidity if not managed promptly.[1]

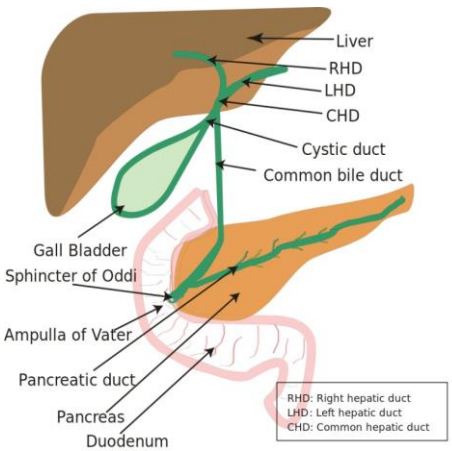

Figure 1: Anatomy of Gallbladder and Biliary System.

Approximately 90–95% of cases are calculous in origin, while acalculous cholecystitis represents a smaller yet more severe subset typically seen in critically ill patients.[1] The clinical presentation often includes right upper quadrant pain, fever, nausea, and leukocytosis, necessitating prompt diagnostic evaluation and management.[1]

The evolution of cholecystitis management has been driven by advances in imaging modalities such as ultrasonography and computed tomography, which improve diagnostic accuracy and facilitate early intervention.[1] Evidence-based guidelines have significantly influenced clinical practice, particularly the adoption of severity grading systems and standardized treatment pathways.[4]

Historically, delayed open cholecystectomy was considered the standard approach; however, current evidence strongly supports early laparoscopic cholecystectomy (ELC) as the preferred treatment modality.[5] This shift has resulted in reduced hospital stay, lower complication rates, and improved patient outcomes.[5]

In addition to surgical innovations, non-operative strategies such as percutaneous cholecystostomy and endoscopic gallbladder drainage have emerged as viable alternatives for patients unfit for surgery.[6] These approaches have expanded the therapeutic landscape, allowing individualized treatment based on patient risk profiles.[6]

Furthermore, antimicrobial therapy plays a crucial adjunctive role in managing infection and preventing complications, with emphasis on rational antibiotic selection and duration to minimize resistance.[8]

Overall, the management of cholecystitis has transitioned toward a multidisciplinary, patient-centered approach integrating surgical, radiological, and medical strategies.[9]

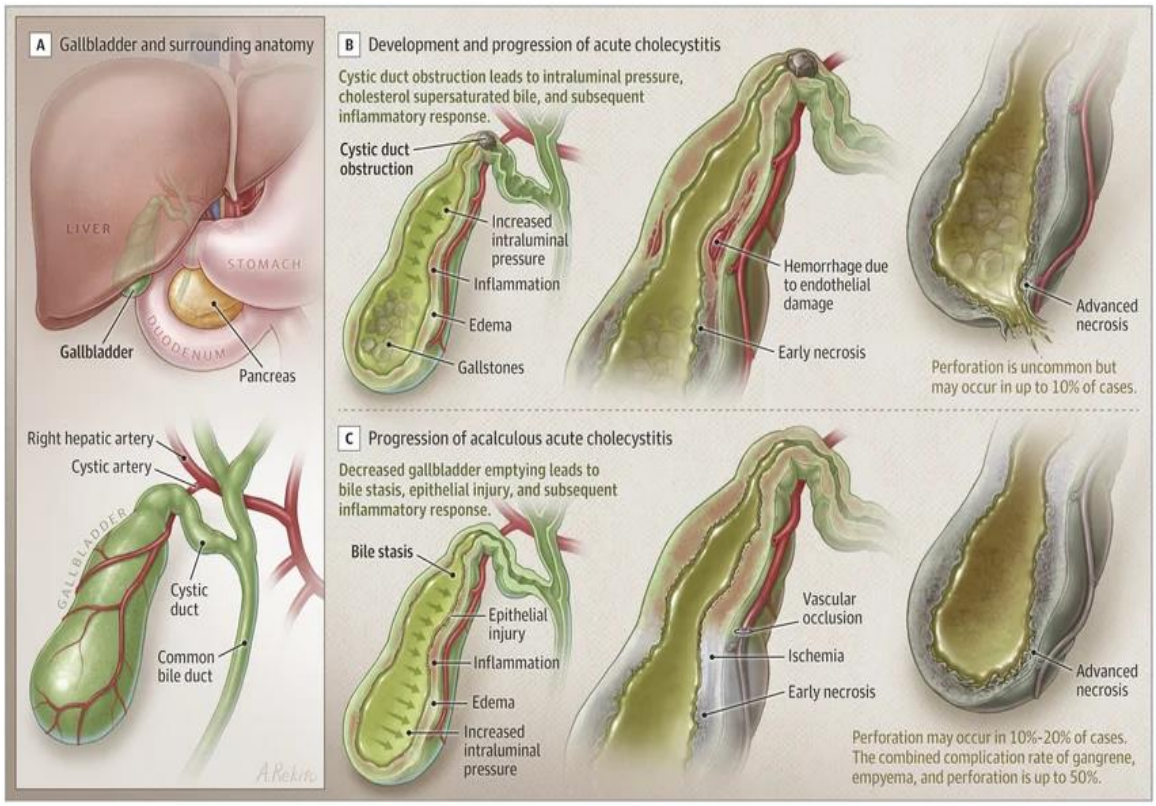

Figure 2: Pathogenesis of Acute Calculous Cholecystitis.

DISCUSSION

The management of cholecystitis has undergone significant transformation over the past two decades, reflecting a shift toward evidence-based and minimally invasive approaches. Early laparoscopic cholecystectomy has become the cornerstone of treatment due to its superior clinical outcomes, including shorter hospital stays and reduced postoperative complications.

In patients with severe disease or high surgical risk, alternative interventions such as percutaneous cholecystostomy have demonstrated efficacy in controlling infection and providing a bridge to definitive surgery. Endoscopic ultrasound-guided gallbladder drainage represents a novel advancement, offering internal drainage with fewer complications compared to percutaneous approaches.

The role of antimicrobial therapy has also evolved, with current guidelines emphasizing targeted therapy based on disease severity and microbiological data. This approach aims to reduce antimicrobial resistance while ensuring adequate infection control.

Recent guidelines highlight the importance of severity grading and risk stratification in guiding treatment decisions. This allows clinicians to tailor interventions, balancing the risks and benefits of surgical versus non-surgical management.

Despite these advancements, challenges remain, including variability in guideline adherence, resource limitations, and the need for further high-quality randomized trials to refine management strategies.

CONCLUSION

The management of cholecystitis has evolved into a dynamic, evidence-driven field characterized by early surgical intervention, minimally invasive techniques, and individualized patient care. Early laparoscopic cholecystectomy remains the gold standard, while alternative modalities provide effective options for high-risk patients. Advances in endoscopic and radiological interventions, along with rational antimicrobial use, have further enhanced clinical outcomes. Future research should focus on optimizing patient selection, improving guideline adherence, and exploring novel therapeutic approaches. A multidisciplinary, patient-centered strategy remains essential for achieving optimal outcomes in cholecystitis management.

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