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ACUTE VS CHRONIC CHOLECYSTITIS: DIAGNOSIS AND TREATMENT APPROACH

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Abstract:
Background: Acute and chronic cholecystitis are two distinct forms of gallbladder inflammation, primarily due to gallstone formation. Each has unique diagnostic and treatment approaches. Their management strategies differ significantly, emphasizing the importance of accurate diagnosis and timely treatment to mitigate risks associated with each form of cholecystitis. **Aim:** an overview to differentiate between acute and chronic cholecystitis in terms of diagnosis and treatment. **Method:** The PubMed and Google Scholar Search Engines were the primary databases used for the search process, with articles collected from 1980 to 2024. **Conclusion:** Cholecystitis, the inflammation of the gallbladder, can be acute or chronic, often caused by gallstones, with acute cases posing serious risks. Diagnosis involves clinical assessments, lab tests, and imaging to differentiate between the types, with ultrasound being the first line of investigation. Laparoscopic cholecystectomy is the gold standard for the radical treatment of both acute and chronic cholecystitis. Non-surgical options are available for symptom relief for specific cases. Both conditions can lead to severe complications, underscoring the importance of timely medical treatment.

Keywords: Cholecystitis, gallbladder, Gallstone, ESR, Diagnostic and Treatment approaches

INTRODUCTION

The gallbladder plays a vital role in the human body, primarily functioning as a storage and concentration site for bile produced by the liver. This bile is essential for the digestion and absorption of fats in the small intestine, facilitating the breakdown of dietary lipids and the absorption of fat-soluble vitamins. When food enters the small intestine, the gallbladder releases bile through a network of bile ducts, which connect it to both the liver and the intestine. This regulated flow of bile is crucial for maintaining a healthy digestive system and ensuring that nutrients are effectively absorbed. The gallbladder's ability to concentrate bile also enhances its effectiveness in emulsifying fats, making them more accessible to digestive enzymes. Moreover, the gallbladder's function is closely linked to the liver's role in bile production. The liver synthesizes bile acids, which not only aid in fat digestion but also play a crucial role in regulating cholesterol and maintaining metabolic homeostasis. The interplay between bile acids and pancreatic enzymes further highlights the gallbladder's vital role in nutrient absorption, as these enzymes work in conjunction with bile to optimize digestion. (1, 2) An inflammation of the gallbladder known as cholecystitis, primarily categorized into two types: acute and chronic. Acute cholecystitis is characterized by sudden inflammation, often due to gallstones obstructing the cystic duct, leading to a medical emergency that necessitates prompt treatment to avoid severe complications such as perforation or sepsis.(3) Chronic cholecystitis, on the other hand, results from repeated episodes of acute cholecystitis or ongoing gallstone disease, leading to scarring and reduced functionality of the gallbladder. This condition can also result in complications such as fistulas and an increased risk of gallbladder cancer. (4) The critical pathophysiological feature of acute and chronic cholecystitis results from various underlying causes, including bile duct obstruction and gallstone formation.

The obstruction of bile flow, often caused by gallstones, leads to bile accumulation in the gallbladder, resulting in inflammation and tissue damage. This inflammatory response is further exacerbated by the release of pro-inflammatory cytokines and other inflammatory mediators, which contribute to tissue injury and impaired gallbladder motility. In addition to inflammation, bacterial infection is a common complication of cholecystitis, often arising from the ascent of bacteria from the gut into the biliary tract. This infection can perpetuate the inflammatory process and lead to further complications, such as gallbladder perforation, which is a life-threatening condition requiring immediate surgical intervention. Moreover, the dysfunction of the Sphincter of Oddi can also play a role in the pathophysiology of cholecystitis, as abnormal contractions can contribute to bile duct obstruction and subsequent inflammation. Impaired bile acid metabolism is another critical aspect, as it can lead to the accumulation of toxic bile acids that exacerbate inflammation and tissue damage. (5-7) The pathophysiology of cholecystitis involves a complex interplay of inflammation, infection, and mechanical dysfunction, necessitating a comprehensive understanding for effective diagnosis and management.

DIAGNOSIS APPROACH OF ACUTE AND CHRONIC CHOLECYSTITIS

The diagnostic approach to both acute and chronic cholecystitis is similar, involving a multifaceted approach that integrates clinical evaluation, laboratory tests, and imaging studies. For acute cholecystitis, the clinical diagnosis is often supported by physical examination findings, such as Murphy's sign [Figure 1], which indicates tenderness in the right upper quadrant and helps differentiate it from other conditions.(8) Differentiating between acute and chronic cholecystitis is crucial for effective management, and various laboratory tests play a significant role in this process. A Complete Blood Count (CBC) is often the first test performed. In acute cholecystitis, it typically reveals an elevated white blood cell count, whereas in chronic cases, the count may be normal or only mildly elevated. Liver Function Tests (LFTs) are also essential, as they can indicate liver involvement. In acute cholecystitis, LFTs often show elevated bilirubin and liver enzyme levels, whereas these values may remain normal or show only mild elevations in chronic cholecystitis. Total bilirubin levels are crucial for assessing the severity of cholecystitis, as they can indicate hepatic dysfunction often associated with the condition.

Monitoring these levels allows healthcare providers to make informed treatment decisions, including the potential need for surgical intervention, such as laparoscopic cholecystectomy, which is a common treatment for symptomatic gallstones and biliary colic. Additionally, the bilirubin-to-alkaline phosphatase ratio is a valuable parameter that aids in distinguishing between hepatic and obstructive causes of jaundice, further emphasizing the importance of bilirubin in the diagnostic process. Similarly, C-reactive protein (CRP) levels are typically elevated in acute cases, reflecting inflammation, whereas they may be normal or slightly elevated in chronic cases. Other inflammatory markers, such as the Erythrocyte Sedimentation Rate (ESR), also help in this differentiation. ESR is typically elevated in acute cholecystitis but may be normal or mildly elevated in chronic conditions. Additionally, bilirubin levels, alkaline phosphatase (ALP), and gamma-glutamyltransferase (GGT) levels are generally elevated in acute cholecystitis, whereas they may be normal or only mildly elevated in chronic cases. (9-11)

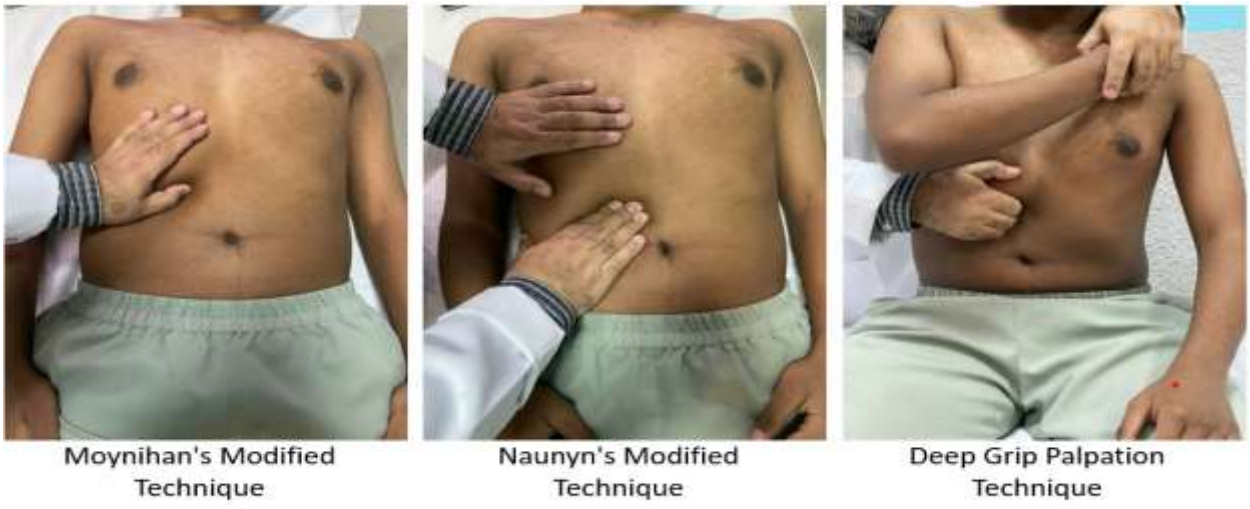

FIGURE (1): MURPHY'S SIGN ELICITATION BY DIFFERENT TECHNIQUES.

Imaging studies also play a crucial role in differentiating between acute and chronic cholecystitis, with ultrasound, CT scans, and MRI being the primary modalities used. Ultrasound is often the first-line imaging technique, capable of identifying key features such as gallbladder wall thickening, pericholecystic fluid, and gallstones, which are essential for diagnosis and management decisions. In acute cholecystitis, gallbladder wall thickening is typically more pronounced and diffuse, while in chronic cholecystitis, it tends to be focal and less pronounced. When ultrasound findings are inconclusive, CT scans become vital, as they can reveal complications like perforation, abscesses, and gangrene, which are critical for timely intervention. CT imaging is particularly beneficial in cases where ultrasound results are ambiguous, as it provides a clearer picture of the gallbladder's condition. MRI is occasionally utilized, especially when both ultrasound and CT scans fail to provide definitive results. It can help visualize gallbladder wall edema and pericholecystic inflammation, further supporting the diagnosis of acute cholecystitis. Additionally, the size and number of gallstones can influence the diagnosis; larger stones are more commonly associated with acute cholecystitis, while smaller stones may indicate chronic conditions. (12, 13) However, it is essential to be aware of potential imaging pitfalls, such as operator dependence and overlapping features between the two types of cholecystitis, which can complicate the diagnostic process.

Endoscopic Retrograde Cholangiopancreatography (ERCP) and Magnetic Resonance Cholangiopancreatography (MRCP) are both essential diagnostic tools for managing cholecystitis; however, they serve different purposes and employ distinct methodologies. ERCP is a minimally invasive procedure that not only diagnoses but also treats conditions affecting the bile and pancreatic ducts, such as removing gallstones or opening blocked ducts. This is particularly relevant in cases of cholecystitis, where bile duct obstruction, often caused by gallstones, can lead to severe complications. In contrast, MRCP is a non-invasive imaging technique that provides detailed images of the bile and pancreatic ducts using magnetic resonance cholangiopancreatography (MRCP), a specialized form of magnetic resonance imaging (MRI). It is primarily used to identify blockages or abnormalities without the need for invasive procedures, making it a safer option for initial diagnosis and treatment. MRCP can effectively guide treatment decisions by revealing the presence of gallstones or other obstructions that may contribute to cholecystitis. While both techniques are valuable, the choice between ERCP and MRCP often depends on the clinical scenario. For instance, if a patient presents with acute cholecystitis and there is a suspicion of bile duct obstruction, ERCP may be preferred for its therapeutic capabilities. Conversely, MRCP may be utilized for a non-invasive assessment when the risk of complications from invasive procedures is a concern.

TREATMENT APPROACH FOR ACUTE CHOLECYSTITIS

The treatment of acute cholecystitis involves a range of approaches, tailored to the severity of the condition and the patient's overall health. Laparoscopic cholecystectomy (LC) is now considered the gold standard for managing symptomatic cholecystolithiasis and is increasingly used for acute cholecystitis due to its minimally invasive nature, which results in reduced postoperative pain and quicker recovery times. However, in high-risk patients or those with severe inflammation, percutaneous cholecystostomy (PC) serves as a safe and effective alternative, providing symptom relief and potentially acting as a bridge to definitive surgical treatment. Antibiotic therapy is also critical in the management of acute cholecystitis, as it helps combat bacterial infections and prevent complications such as sepsis. In cases where surgery is not immediately feasible, conservative management, including supportive care and antibiotics, may be employed, particularly for patients with mild symptoms or those unsuitable for surgery. For patients with acute biliary pancreatitis, endoscopic retrograde cholangiopancreatography (ERCP) can be utilized to remove gallstones from the bile ducts, complementing other treatment modalities. In some instances, delayed cholecystectomy may be indicated, allowing for surgery to be postponed until inflammation subsides, which is particularly beneficial for high-risk surgical candidates. (14-17)

TREATMENT APPROACH FOR CHRONIC CHOLECYSTITIS

Chronic cholecystitis is primarily treated through surgical intervention, with laparoscopic cholecystectomy (LC) being the gold standard due to its minimally invasive nature and favorable outcomes. This procedure significantly reduces recovery time and scarring compared to open cholecystectomy (OC), which is reserved for cases where laparoscopic techniques are not feasible, such as severely inflamed or damaged gallbladders. In recent years, advancements in surgical techniques have introduced options like single-incision laparoscopic surgery (SILS) and robotic-assisted cholecystectomy. SILS minimizes scarring further by utilizing a single incision, while robotic-assisted cholecystectomy enhances visualization and dexterity, potentially reducing the risk of complications. Both methods have shown similar postoperative outcomes to traditional laparoscopic approaches, making them viable alternatives

for patients. In addition to surgical options, non-surgical treatments may be employed, particularly in patients who are not candidates for surgery. Gallbladder drainage can provide temporary relief by alleviating symptoms and preventing complications such as sepsis. Furthermore, antibiotic therapy is often utilized to manage infections associated with chronic cholecystitis, although it may not address the underlying dysfunction of the gallbladder. (14, 18, 19) For symptomatic relief, pain management strategies, including medications and lifestyle modifications, are crucial in improving the quality of life for patients suffering from chronic cholecystitis. Natural remedies, such as dietary changes and herbal supplements, may also be considered, although their effectiveness can vary, and they should not replace conventional medical treatment.

COMPLICATIONS

Acute and chronic cholecystitis can lead to a range of serious complications that significantly impact patient health. In acute cholecystitis, one of the most critical complications is sepsis, which occurs when the infection spreads to the bloodstream, potentially resulting in organ failure and death if not treated promptly with antibiotics and medical intervention. Another severe complication is gallbladder perforation, where the gallbladder ruptures, leading to peritonitis and life-threatening infections; early diagnosis and surgical intervention are crucial to prevent this. Additionally, gangrene of the gallbladder can occur, characterized by tissue death due to inadequate blood supply, which can also lead to perforation and sepsis. Chronic cholecystitis, on the other hand, can result in complications such as biliary dyskinesia, where abnormal gallbladder muscle contractions lead to chronic abdominal pain and decreased quality of life. Furthermore, chronic cholecystitis can lead to gallbladder cancer, a rare but severe condition that can metastasize and result in high mortality if not diagnosed early. Chronic diarrhea may also arise due to bile acid malabsorption, resulting from gallbladder dysfunction, which can lead to malnutrition and further health issues. (20-24)

CONCLUSION

Cholecystitis, the inflammation of the gallbladder, can be acute or chronic, often caused by gallstones, with acute cases posing serious risks. Diagnosis involves clinical assessments, lab tests, and imaging to differentiate between the types, with ultrasound being the first line of investigation. Laparoscopic cholecystectomy is the gold standard for the radical treatment of both acute and chronic cholecystitis. Non-surgical options are available for symptom relief for specific cases. Both conditions can lead to severe complications, underscoring the importance of timely medical treatment.

Conflict of Interest

The authors declare they don’t have any conflict of interest.

Author contributions

All authors contributed in manuscript writing, data collection, editing, table creating and given the approval for manuscript submission to journal for publication.

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Ethical Approval

Not Applicable

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