

Cholelithiasis: Diagnostic and Therapeutic Approach

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ABSTRACT

Cholelithiasis is a medical condition characterized by the presence of gallstones in the choledochus, also known as common bile duct. Understanding the epidemiology, diagnosis, and treatment of this disease is essential to providing quality care to patients. Treatment options range from conservative management to interventional procedures such as ERCP and laparoscopic surgery. The choice of therapeutic approach will depend on the comprehensive evaluation of the patient and the discussion between the doctor and the patient, aiming to achieve the best clinical outcomes and improve quality of life.

KEYWORDS: Cholelithiasis, diagnosis, treatment

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INTRODUCTION

Cholelithiasis is a medical condition characterized by the presence of gallstones in the choledochus, also known as common bile duct. This disease represents one of the most frequent complications of cholelithiasis and can have severe consequences if not correctly diagnosed and treated. This literature review article will provide an overview of the epidemiology, clinical significance, diagnostic methods, and treatment options for cholelithiasis.¹

Cholelithiasis can have significant and potentially severe clinical consequences. Obstruction of the common bile duct by gallstones can lead to complications such as cholangitis, biliary pancreatitis and obstructive jaundice. These conditions can be life-threatening if not treated properly.²

Definition

Cholelithiasis is defined as the presence of gallstones in the common bile duct, the tube that carries bile from the gallbladder to the small intestine. These stones can be of primary origin, formed directly in the common bile duct, or secondary, migrating from the gallbladder through the cystic duct. Gallstones are composed mainly of cholesterol, bilirubin, or a combination of both.¹

Primary cholelithiasis stones are commonly composed of calcium bilirubinate while secondary cholelithiasis stones are mainly cholesterol or mixed composition.³

Epidemiology

Cholelithiasis is a common pathology worldwide and affects approximately 10%-15% of the adult population in developed countries, but the incidence can be higher in regions like

South America and Native American populations. The incidence and prevalence of the disease are also associated with risk factors, such as age older than 40, female gender, weight loss and concomitant biliary disorders.^{1,4}

Diagnosis

The clinical relevance of on-time diagnosis and treatment remains in preventing cholelithiasis complications that significantly raise morbidity and mortality, such as cholangitis and acute biliary pancreatitis.¹

The diagnosis of cholelithiasis involves the clinical evaluation of the patient and the use of diagnostic imaging tests and laboratory analysis. The clinical picture can range from asymptomatic patients to those with typical symptoms such as right upper quadrant pain, jaundice, nausea and vomiting.⁵

Laboratory tests are a helpful diagnostic strategy when suspecting cholelithiasis. High levels of GGT, alkaline phosphatase, and total and direct bilirubin are the parameters with the best predictor performance. In addition, amylase and lipase levels may be evaluated to rule out the presence of associated biliary pancreatitis.³

Imaging tests play a critical role in the diagnosis of cholelithiasis. Abdominal ultrasound is often the first study performed in the context of biliary pain and can identify gallstones in the gallbladder and, in some cases, in the common bile duct. However, the sensitivity of ultrasound to detect stones in the common bile duct is limited. Indirect signs of obstruction, such as dilatation of the common bile duct, are other predictor findings of cholelithiasis.

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Nonetheless, dilatation can also be found in advanced age and people who have undergone cholecystectomy.^{1,6}

Additional studies such as endoscopic retrograde cholangiopancreatography (ERCP) and magnetic resonance cholangiography (MRCP) may be performed for a more accurate assessment of the common bile duct. ERCP is an invasive technique combining endoscopy and radiology to diagnose and treat cholelithiasis. It allows the identification and removal of gallstones in the common bile duct. MRCP, on the other hand, is a noninvasive technique that uses magnetic resonance imaging to visualize the bile ducts and detect stones.⁷

Diagnostic approaches must be based on the patient's individual characteristics and the availability of resources. Guidelines like those from ASGE provide a helpful tool for decision-making. ASGE 2019 guidelines classify as high-risk of cholelithiasis those patients that present with either a common bile duct stone on ultrasound or clinical ascending cholangitis or a total bilirubin >4mg/dL and dilated common bile duct on imaging (>6mm with gallbladder in situ). Those with any of these three criteria should directly undergo ERCP as a diagnostic and therapeutic approach. Intermediate risk criteria include dilated common bile duct alone, abnormal liver tests or age >55 years. These patients should be further evaluated with endoscopic ultrasound, MRCP or laparoscopic intraoperative cholangiography. Patients without any of these risk factors should directly undergo cholecystectomy.⁸

Treatment

Due to the potential complications of cholelithiasis, treatment is recommended even in asymptomatic patients. The approach may vary depending on the clinical presentation, the presence of complications, and the availability of technical resources.³

ERCP with stone extraction is a commonly used option to address common bile duct stones. During this procedure, an endoscope is used to access the common bile duct and the stones are removed using dilation, sphincterotomy, or mechanical removal techniques.⁹

With advances in technology and surgical techniques, laparoscopic cholecystectomy has become the gold standard for the treatment of cholelithiasis. This minimally invasive approach allows the use of special surgical tools to remove not only the gallbladder but also the stones inside the common bile duct.¹⁰

There are different therapeutic approaches in cases of cholelithiasis, each of them with its advantages. Preoperative ERCP followed by Laparoscopic cholecystectomy or vice-versa are widely used. However, they have some disadvantages like longer time of hospitalization. One-session options like laparoscopic exploration of the common bile duct and ERCP during laparoscopic cholecystectomy or rendezvous technique shorten hospital stay and reduces anesthetic events. However, they require a higher level of expertise and specific equipment availability.¹

DISCUSSION

Cholelithiasis is a common disease that requires careful evaluation and an appropriate therapeutic approach. The availability of different diagnostic and treatment options has significantly improved the care of patients with cholelithiasis. Abdominal ultrasound is a helpful tool for detecting gallstones, but its sensitivity for detecting common bile duct stones is limited. Therefore, the selection of patients for additional imaging tests, such as ERCP and CRM, to achieve a more accurate assessment should be individualized.⁶⁻⁸

In terms of treatment, removing gallstones in the common bile duct is essential to relieve symptoms and prevent complications. ERCP has been widely used and is considered the gold standard for the management of cholelithiasis. However, laparoscopic exploration has also proven to be a safe and effective option.^{8,10}

CONCLUSION

It is important to stress the importance of careful evaluation and an individualized treatment strategy. Each patient presents unique characteristics and needs, and the decision of treatment modality should be based on a thorough evaluation and an open discussion between the physician and the patient. Cholelithiasis is a common and significant clinical condition that requires an appropriate diagnostic and therapeutic approach. Understanding cholelithiasis' epidemiology, diagnosis, and treatment is essential to provide optimal patient care. Treatment options are vast. The choice of therapeutic approach will depend on various factors, such as the severity of symptoms, the presence of complications and the patient's individual characteristics.

ERCP has been shown to be effective in the management of cholelithiasis, allowing the removal of gallstones and relief of symptoms. However, this procedure may be associated with certain risks, such as pancreatitis, perforation of the bile ducts, and infection. On the other hand, laparoscopic exploration offers a minimally invasive surgical option, with a shorter recovery time and lower risk of complications compared to open surgery.

In summary, cholelithiasis is a common disease that requires a proper diagnostic and therapeutic approach. Understanding the epidemiology, diagnosis, and treatment of this disease is essential to providing quality care to patients. Treatment options range from expectant management to interventional procedures such as ERCP and laparoscopic surgery. The choice of therapeutic approach will depend on the comprehensive evaluation of the patient and the discussion between the doctor and the patient, aiming to achieve the best clinical outcomes and improve quality of life.

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