

Original Article

CHOLEDOCHOLITHIASIS: COMMON CAUSE OF EXTRAHEPATIC BILIARY OBSTRUCTIVE JAUNDICE AND DIAGNOSTIC EFFICIENCY OF ULTRASONOGRAPHY

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Abstract

Background: Noninvasive methods that have been used for diagnosis of bile duct stones include ultrasonography, computed tomography and magnetic resonance cholangiopancreatography without use of contrast media. Ultrasonography is the popular, safe, cost effective and effective initial modality for the investigation of obstructive jaundice. **Objectives:** To identify the magnitude of calculus disease as the cause of extra hepatic biliary obstructive jaundice and role of ultrasonography in the diagnosis. **Methodology:** One year (Aug 2005- July 2006) case records of obstructive jaundice attended in Bir Hospital for ERCP were analyzed. Those all cases were evaluated by ultrasonography prior to admission in the hospital. Among them, the record of those cases carrying or suspected choledocholithiasis was identified and their USG findings correlated with the ERCP results. **Results:** Among the 73 case records enrolled in study, 20 cases were diagnosed choledocholithiasis, and suspected same in other 4 with other differential diagnosis. ERCP diagnosis was similar in 20 cases,

among other four cases with differential diagnosis, two were found to be stone in distal CBD and there was periampullary mass in one. Another one case was negative for calculus disease but it was diagnosed juxta papillary diverticulum, otherwise the ERCP was reported no obstructing lesion. This result shows USG diagnosis was correct in 83.33%, supportive in two and different in remaining two cases in comparison to ERCP. Choledocholithiasis was more common in female (N=15, 75.0%) than the male (N=4, 25.0%). **Conclusion:** Our result indicate that the majority of cases of choledocholithiasis can be diagnosed with ultrasonography.

Keywords

Obstructive jaundice, Choledocholithiasis, Ultrasonography, ERCP.

Introduction

Stones in the common bile duct occur in 10-15% of patients with gall stones¹. Stone in the bile duct are less frequent than the gall bladder but this is the most common cause of extrahepatic obstructive jaundice and may progress to serious complications like

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recurrent colicky pain, cholangitis, pancreatitis or chronic liver disease (biliary cirrhosis). Many common bile duct stones are discovered during initial investigation prior to gall bladder surgery and removed during operation. But stones may be missed despite of sincere search during operation and they can cause clinical obstruction after weeks, months or years. Choledocholithiasis can be suspected clinically but it requires conformation before deciding the line of management. There are several diagnostic methods for detection of choledocholithiasis such as ultrasonography (USG), computed tomography (CT), percutaneous transhepatic cholangiography (PTC), endoscopic retrograde cholangiopancreatography (ERCP), oral or intravenous contrast media and magnetic resonance cholangiopancreatography (MRCP)².

Objectives

To identify the magnitude of calculus disease as the cause of extra hepatic biliary obstructive jaundice and efficacy of ultrasonography in the diagnosis.

Methodology

One year (Aug 2005- July 2006) record of the cases with obstructive jaundice attended in Bir Hospital for ERCP were analyzed. All

those cases were evaluated by ultrasonography prior to admission in the hospital. Among them, the record of those cases carrying or suspected choledocholithiasis was identified. All of the cases were evaluated by ERCP and the USG finding was correlated with the ERCP results.

Results

Among the 73 case records (male 20, female 53) enrolled in study 20 cases (male 4, female 19) were diagnosed choledocholithiasis as per USG. Four cases were reported as distal CBD obstruction with differential diagnosis including choledocholithiasis. So the USG result of 24 total cases (diagnosed 20, and suspected 4) was compared with ERCP findings. ERCP diagnosis was similar in 20 cases, remaining four cases with differential diagnosis including choledocholithiasis, two were found to be stone in distal CBD and there was periampullary mass in one. Another one case was negative for calculus disease but it was diagnosed juxta papillary diverticulum with suspected choledochal cyst otherwise the ERCP was reported no obstructing lesion. This result shows USG diagnosis was correct in 83.33% in comparison to ERCP, at it was supportive in two and different in remaining two cases. Choledocholithiasis was more common in female (N=15, 75.0%) than the male (N=4, 25.0%) as other common reports.

Discussion

Obstructive jaundice is termed when obstruction to bile flow in extrahepatic ducts between the porta hepatis and the papilla of Vater¹. Post hepatic obstructive jaundice is also called surgical jaundice. In surgical practice among adults, obstructive jaundice

may be due to calculus disease, mass lesion or strictures that may be benefited by surgical correction³. Obstruction in common bile duct may be complete, intermittent, chronic intermittent or segmental obstruction.

Choledocholithiasis, periampullary tumors, duodenal diverticula, papilloma of bile duct, choledochal cyst, and biliary parasites are the main causes of intermittent jaundice⁴.

Choledocholithiasis may be primary or secondary⁵. Primary bile duct stones may develop within the common bile duct many years after a cholecystectomy and secondary to accumulation of biliary sludge with dysfunction of sphincter of Oddi¹. Stone primarily formed in gall bladder and dislodged into biliary duct are called secondary ductal stones. Passage of gall stones into the CBD occurs approximately 10-20% of cases with cholelithiasis^{1,6}. In most cases stones within the bile duct migrate from the gall bladder. Stones that form primarily within the bile ducts are relatively uncommon and may be seen in patients with biliary stricture, cholangitis, choledochal cyst. Choledocholithiasis is one of the common complications of cholelithiasis⁷. Stones are usually located in CBD but they may be found in intrahepatic bile ducts. Majority of patients with CBD stone are symptomatic, commonly present with pain and jaundice or some time fever if there is cholangitis. Common bile duct stones can cause partial or complete bile duct obstruction and may be complicated by stricture, cholangitis, due to secondary bacterial infection, liver abscesses and septicaemia¹.

Multiple noninvasive techniques have been used for the diagnosis of calculi in the bile duct including ultrasonography. Imaging techniques for the evaluation of extrahepatic biliary obstruction has developed dramatically in recent decades along with the expansion of interventional techniques related to the disease. Ultrasonography, computed tomography, direct cholangiography (PTC or ERCP), MRI are highly effective in the detection of biliary duct pathology⁸. Major objective of performing radiological evaluation is to find out the cause of obstructive jaundice.

Plain radiography is the poor diagnostic method for obstructive biliary disease. Oral cholecystography or intravenous cholangiography allow demonstration of the number, size of calculi and patency of bile ducts. The role of cholecystography has been limited in these days after advantages of ultrasonography in detection of biliary calculi and related diseases. The most convenient method of demonstrating obstruction to the common bile duct is by ultrasonography which shows dilated intra and extra hepatic biliary ducts together with gallbladder stones. It shows highly echogenic structure casting strong distal acoustic shadow in bile duct and nonshadowing structures in the duct are less likely to be stone. Small stones which are not occluding the lumen may move with the change of position of the individual. Ultrasonography is perfect method for suspected biliary obstruction, and endoscopic or preoperative USG are recent advances for the evaluation of biliary tract. With the improvement of ultrasonographic technique and equipment the accuracy of the diagnostic confidence is higher in comparison to previous days. USG is highly

sensitive to detect dilatation of biliary tree. Detection of bile duct stones is increased with sensitivities ranging from 22%- 82% by ultrasonography. The sensitivity of ultrasonography is higher in the detection of proximal common bile duct stones than in its distal segment.

Figure 1: Ultrasonographic finding of common bile duct stone; dense echo with distal shadow in common bile duct at the level of pancreatic head. Common bile duct is dilated.

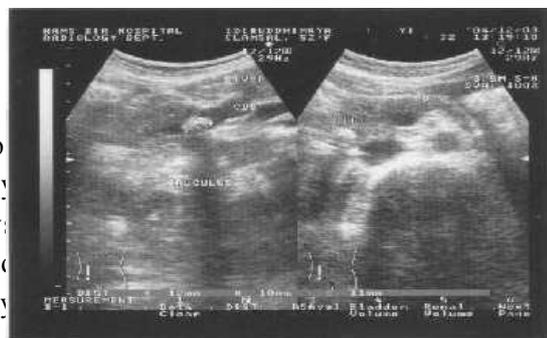


Figure 2: ERCP finding of common bile duct stones; multiple small filling defects in distal common bile duct with mild its mild dilatation.



ERCP is excellent method for the evaluation of choledocholithiasis and it is superior to the other diagnostic methods in respect to distal CBD obstruction and endoscopic papillotomy has been proven to be successful therapy for

choledocholithiasis and also permits retrograde placement of stent¹¹. CT is usually not performed to diagnose choledocholithiasis, it is useful in whom ERCP is contraindicated or when MRCP is not available. In most common CT appearance in choledocholithiasis is a high density calcification in common bile duct and focal soft density surrounded by bile is seen less frequently¹². ERCP is some complicated procedure where as the ultrasonography is safe and no any complications. Post ERCP complications include acute pancreatitis, bleeding, infection and problems with sedation¹³.

MRCP has shown good sensitivity 86-100% and specificity 85-100% for ductal stones relative to ERCP. The stones are detected as focal round or linear low signal by surrounding high T2 signal in bile duct. An impacted stone may not be completely surrounded by bile and it may look like stricture⁴. MRCP is more sensitive than ERCP for the detection of intrahepatic calculi

In our study, total enrolled cases were 73. Among them ultrasonography was able to detect stones in common bile duct (in 20 cases) or suspect (in 4 cases), it was over all 32.87% in total enrolled cases of obstructive jaundice including mass lesion, strictures, choledochal cyst and ascariis in CBD. ERCP reported calculus disease in additional two cases with total 22. In remaining two, one case reported as periampullary mass and next one as juxtapapillary diverticulum. The level of obstruction was distal in all those four cases. Choledocholithiasis was found common in female than the male, the ratio was to be 1:4 in our study group.

Conclusion

According to the result of this study, diagnosis of choledocholithiasis can be correctly made in 83.33% of cases by USG. The accuracy of ultrasonography is higher in the detection of proximal common bile duct stones than in its distal segment. Ultrasonography may not be as effective as ERCP in the detection of distal obstructive pathology, possibly due to gastroduodenal gas artifacts in this region. Diagnostic accuracy by ERCP is superior when the obstruction is in distal common bile duct and it has the advantage over USG that ERCP not only cause a diagnosis of obstruction, but common bile duct stones can be removed. Diagnosis of intrahepatic biliary duct dilatation can be made by ultrasonography in 100% of the cases, so it classifies the jaundice is either medical or surgical obstructive jaundice in initial presentation.

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