Imaging in Obstructive Jaundice: A Review with Our Experience.

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Abstract: *A brief review of the different imaging modalities in obstructive jaundice with the relative advantages and disadvantages are described. Comparison of the different diagnostic modalities available in obstructive jaundice based on available literature. Role of non –invasive imaging modality like ultrasound which serves as a preliminary investigation in comparison to other non-invasive imaging modalities like MRCP and CECT (contrast-enhanced computed tomography) are highlighted here. Also the role of other available invasive imaging modalities like ERCP(Endoscopic retrograde Cholangiopancreatography), PTC (per cutaneous cholangiopancreatography) in the setting of obstructive jaundice is discussed herewith. Ultrasound remains one of the easily available preliminary imaging modality in obstructive jaundice. However limitations due to inability to tell the exact extent of the lesion and the inability to detect small stones in the distal CBD exist, which are overcome in MRCP (Magnetic Resonance Cholangiopancreatography). MRCP with its higher diagnostic accuracy, is another upcoming non-invasive modality which will answer most of our questions in the clinical setting of obstructive jaundice. In a study conducted in our hospital with 60 cases of clinical obstructive jaundice, it was found that the sensitivity of detecting the presence and level of obstruction was almost same 100% vs 100% and 98% vs 100% respectively. But it was found that with respect to the extent and cause of obstruction ultrasound was not as sensitive (67% vs 94%) and specific (68% vs 89%)as compared with CECT and MRCP. Additionally, MRCP with MRI helped detect the presence of small metastases missed by ultrasound and CECT. Ultrasonography though easily available preliminary imaging modality in obstructive jaundice is often not able to diagnose the exact cause and extent of lesion whereby more advanced imaging modality like CECT and MRCP plays an important role to accurately diagnose the exact cause and extent of the underlying lesion expediting accurate diagnosis and further aiding in patient management.*

INTRODUCTION

The initial evaluation of obstructive jaundice involves distinguishing intra-hepatic and extra-hepatic biliary obstruction. Clinical data such as history, physical examination and laboratory tests has been shown to accurately identify upto 90% of patients whose jaundice is caused by extra-hepatic obstruction[1]. Appropriate management depends upon the identification of patients who would benefit from surgery or a therapeutic intervention.

The goal of any radiologic procedure in obstructive jaundice is to confirm the presence of biliary obstruction by detecting biliary dilatation, its exact location, extent and probable cause. A number of imaging modalities are available for the evaluation of obstructive jaundice. Current technologies include trans abdominal ultrasound(US), endoscopic retrograde cholangiopancreatography (ERCP), Endoscopic ultrasound (EUS), percutaneous transhepatic cholangiopancreatography (PTC), magnetic resonance cholangiopancreatography (MRCP), helical Computed Tomography (h CT), and helical CT cholangiography (hCTC).

The various imaging modalities are classified into direct and indirect techniques[2]. The former are more invasive, and include ERCP and PTC. Though more sensitive (90%) and specific (98%) they are limited to the evaluation of intrinsic biliary tree and cannot define the extrinsic pathologies causing obstruction. The main advantage of these techniques, is the ability to sample tissue and perform therapeutic maneuvers, such as biliary drainage, stenting or stone removal. However, they carry higher risks of complications like bleeding, perforation or bile leak[3]. Moreover the required expertise and their availability is limited. Therefore the use of direct techniques is reserved to specific clinical situations.

Indirect techniques are more widely used as they offer negligible procedural risk and also allow staging of pancreaticobiliary malignancies. In addition to ultrasonography, new indirect modalities, such as magnetic resonance cholangiopancreatography (MRCP) (with solid organ MR), endoscopic ultrasonography (EUS), and helical CT cholangiography (hCTC) (with CT) are now available .They offer improved image quality and enhance diagnostic capabilities to enable surgeons to chose an optimum therapeutic option for decreasing the morbidity and mortality in patients of obstructive jaundice.

MATERIALS AND METHODS

Study Setting

All patients with clinical or biochemical features suggestive of obstructive jaundice underwent transabdominal ultrasonography followed by contrast enhanced CT abdomen. Magnetic Resonance Cholangiopancreatography (MRCP) and the diagnostic accuracy compared.

Trans Abdominal Ultrasonography

All US studies were performed with 3.5-5.5MHz convex transducer probe (HDI 5000 PHILIPS MEDICAL SYSTEM after an overnight fast.

Contrast Enhanced CT Abdomen

CECT was performed after overnight fasting after giving intravenous contrast with phasic acquisition using a four slice CT Scanner.

Magnetic Resonance Cholangio Pancreatography (MRCP)

MRCP was performed after a period of overnight fast by MR scanner 3.0 TESLA SIGNA DX GENERAL ELECTRIC (GE) using eight channel body coil. 2D and 3D breathhold MRCP acquisition using sequences fast reversal fast spin echo (FRFSE) and steady state fast spin echo (SSFSE). Additionally T2 weighted fast spin echo (T2 FSE) or fat-saturated (FATSAT) sequences were performed to locate the dilated biliary and pancreatic ducts.

RESULTS

Ultrasound was found to be the preliminary investigation of choice for the diagnosis of the presence of obstruction and to some extent the level of obstruction. But it was outseeded by other more technically advanced modalities like CECT and MRCP with MRI for the detection of the actual cause of obstruction. In our study , USG could pick up the presence of biliary obstruction in almost all cases (100%), as compared to previous studies (78-98%) [24,25].Accurate detection of the level was possible in 58 cases (98%) as compared to reported studies 27-95%and to a much lesser extent the cause

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