Ain Shams University
Faculty of Medicine
Department of Radiodiagnosis

Role of Ultrasonography versus Multislice CT in Diagnosis of Biliary Obstruction

by

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M.B.B.CH

Submitted in Partial Fulfillment of the Requirements for Degree M.Sc in Radiodiagnosis

Supervised By

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Ahmed Mohamed Hamdy Hashish

2010

Dedication

With All My Love

محمد رسول اللّه

To

My Mother

This work without my mother love, support and encouragement, this essay and many of my individual accomplishments, would never have materialized.

Ahmed Mohamed Hamdy Hashish
2010

Contents

List of Abbreviations

CBD	Common bile duct
CCA	Cholangiocarcinoma
CCC	Central cholangiocarcinoma
CD	Common duct
CECT	Contrast Enhanced CT
CHD	Common hepatic duct
Cm	Centimetre
CT	Computed tomography
EHBDs	Extra hepatic biliary ducts
ERCP	Endoscopic retrograde Cholangiopancreatography
EUS	Endoscopic Ultra sonography
FNA	Fine needle aspiration
GB	Gall bladder
GDA	Gastro-duodenal artery
HCT	Helical Computed Tomography
HCTC	Helical Computed Tomography Cholangiography
HU	Hounsfield unit
IDUS	Intra ductal Ultra sonography
IHBDs	Intra hepatic biliary ducts
IVC	Inferior vena cava
LHD	Left hepatic duct
MDCT	Multi-detector computed tomography
MHz	Mega hertz
MIP	Maximum intensity projection
ML	Mille litre
MM	Mille meter
MPR	Multi-planar reformation
MPV	Mean portal vein

MRC	Magnetic resonance cholangiography
MRCP	Magnetic resonance Cholangiopancreato-graphy
MRI	Magnetic resonance imaging
NECT	Non-Contrast Enhanced CT
PD	Pancreatic duct
PSC	Primary sclerosing cholangitis
PTC	Percutaneous transhepatic cholangiography
PV	Portal vein
RAD	Right anterior duct
RHD	Right hepatic duct
RPD	Right posterior duct
RPO	Right posterior oblique
Sec	Second
SMA	Superior mesenteric artery
US	Ultra sonography

Introduction

In patients with biliary obstruction, determining the level and the cause of the obstruction is essential because it can be a key factor for the next step in diagnostic or therapeutic intervention ***(Kim et al., 2005).***

Many imaging modalities are available for the evaluation of patients with suspected biliary obstruction. Commonly used procedures include ultrasonography (US), Computed tomography (CT), Endoscopic retrograde Cholangiopancreatography (ERCP) and percutaneous transhepatic cholangiography (PTC). The limitation of these modalities has led to increasing popularity of magnetic resonance Cholangio-pancreatography (MRCP) ***(Upadhyaya et al., 2006).***

Sonography remains the primary imaging modality for the initial assessment of patients with biliary obstruction. As such, it often gives the first clues to the presence of a malignant hilar obstruction. Worldwide, sonography remains an important tool in the detection and staging of these lesions. The isoechoic nature of the some tumors and their propensity to grow in an infiltrative periductal pattern make their detection and the determination of their extent difficult. Often the location of the tumor is inferred from sonograms on the basis of the level of ductal obstruction and irregularity of the walls of the duct, whereas the actual borders of the lesion are not visualized ***(Khalili et al., 2003).***

Conventional CT scan does not provide adequate information about the pancreaticobiliary ductal anatomy and its abnormalities because the orientation of these ducts is not suitable for axial images. For this reason, endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous transhepatic cholangiography (PTC) have been used as the most sensitive and specific diagnostic modalities and moreover these techniques have therapeutic potential as well. However, ERCP and PTC are more invasive and time-consuming compared to CT scan. As a non-invasive modality, MR cholangiopancreatography (MRCP) has recently

become a well-established diagnostic tool for assessing the pancreatico - biliary tree ***(Hyun et al., 2007).***

Multi-detector row CT (MDCT) is a major advance in the field of diagnostic imaging because it allows a fast table speed, and when combined with thin slices, permits data collection that is well suited for workstation analysis. Cholangiopancreatographic images can be produced using a workstation with advanced post processing techniques such as multiplanar reformations (MPR) and minimum intensity projections (MIP). The MPR images using MDCT gives rapid assessment of the pancreaticobiliary ducts along different planes without loosing information about the surrounding structures. By using the MIP technique, the fluid density, as contained in the pancreatico- biliary duct, is picked up from the contrast enhanced vessel together with that of the enhanced hepatic and pancreatic parenchyma. The combined use of MPR and MIP techniques significantly improves the images of the pancreatic and bile ducts and their site of confluence compared with those obtained by the axial CT ***(Hyun et al., 2007).***

Aim of the work

Is to highlight the role of ultrasonography versus multislice CT in diagnosis of biliary obstruction.