بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / مني مغربي أحمد

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

Role of Transient Elastography (Fibroscan) In Diagnosis and Staging of Liver Fibrosis in Chronic Liver Diseases Among Paediatrics

Thesis

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By:

Karim Mahmoud Mohamed kamal

M.B.B.CH,

Under supervision of

Prof. Dr. Mohamed Sobhi Hassan Sayed

Professor of Radiology
Faculty of medicine, Ain Shams University

Dr. Ahmed Mohamed Samy El Shimy

Lecturer of Radiology
Faculty of medicine, Ain Shams University

Ain Shams University
Faculty of medicine
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بسم الله الرحمن الرحيم
قَالوُاسُبحَانَك لاَعلِمَ لنَا إلا مَاعَلمتَناَ
إنكَ أَنتَ العَلِيمُ الحَكِيمُ
صدق الله العظيم
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ACE	Angiotensin-converting enzyme
ALT	Alanine aminotransferase
APRI	AST/platelet ratio index
ARFI	Acoustic radiation force impulse
AST	Aspartate amino transferase
AUROCs	Area under the receiver operating characteristic curves
BMI	Body mass index
CAP	Controlled attenuation parameter
CBC	Complete blood count
CFLD	Cystic fibrosis-associated liver disease
CHA	Common hepatic artery
CHB	Chronic hepatitis b
CHD	Common hepatic duct
CLDs	Chronic liver diseases
CT	Computed tomography
E	Elastic modulus
ECM	Extracellular matrix
GDA	Gastroduodenal artery
HB	Hemoglobin
HCC	Hepatocellular carcinoma
HCV	Hepatitis c virus
HDL	High-density lipoprotein
IHPBA	International Hepto-Pancreato-Biliary Association
IMV	Inferior mesenteric vein
IQR	Interquartile range
IVC	Inferior vena cava
kPa	kilopascals
LDL	Low-density lipoprotein
LGA	Left gastric artery
LHA	Left hepatic artery
LHV	Left hepatic vein
LS	Liver stiffness
LSM	Liver stiffness measurement
MHV	Middle hepatic vein
MMP	Matrix metalloproteinase-1
MRE	Magnetic resonance elastography
NAFL	Nonalcoholic fatty liver
NAFLD	Nonalcoholic fatty liver disease

NASH	Nonalcoholic steatohepatitis
P.T	Prothrombin time
PCR	Polymerase chain reaction
RES	Reticuloendothelial system
RHV	Right hepatic vein
SMA	Superior mesenteric artery
SMV	Superior mesenteric vein
SWE	Shear wave elastography
TE	Transient elastography
TIMP-1	Tissue inhibitor matrix metalloproteinase 1
US	Ultrasonographic
V	Velocity
VLDL	Very low density lipoproteins
WBCS	White blood cells

ABSTRACT

Background; Transient elastography (TE) is a reliable tool for the non-invasive assessment of liver fibrosis in routine clinical practice. The widespread adoption of this technology is certain to increase the use of TE worldwide. Although TE has been well validated in chronic viral hepatitis, its clinical role in other liver diseases remains less clear, **Aim and objectives;** to assess the role of transient elastography (fibroscan) in diagnosis and staging of liver fibrosis in chronic liver diseases among paediatrics in comparison to liver biopsy, **Subjects and methods;** This is cross sectional study, was carried out on Children with chronic liver disease undergoing biopsy in Ain Shams University Hospitals during a period of 6 months, **Result;** Fibroscan and biopsy showed high substantial agreement regarding fibrosis stage (fibrosis or no fibrosis) with kappa (κ) 0.667, **Conclusion**; Noninvasive methods, such as transient elastography and fibrosis marker scores, seem to be useful tools to assess liver fibrosis in these patients and may be helpful to recognize a progression of the liver disease during routine follow-up. TE is a portable, highly accessible, reliable, and reproducible noninvasive modality that can be used to screen for liver disease and assess severity of fibrosis in children with CF, **Keywords; Transient elastography, Non-invasive, Fibrosis, Chronic**

INTRODUCTION

Liver fibrosis is the common end-point of a variety of chronic liver diseases. The progression of liver fibrosis leads to cirrhosis, decompensation, liver failure, hepatocellular carcinoma (HCC) and death ***(Jung and Yim, 2017).***

Accurate diagnosis of liver fibrosis and cirrhosis is essential for prognostication of liver disease and for timely intervention to prevent negative outcome ***(Thiele et al., 2018).***

Histopathologic assessment of fibrosis on liver biopsy remains the reference standard for determining the severity of fibrosis, yet is associated with complications ***(Qi et al., 2018).*** Children are exposed to additional risk with liver biopsy due to need for anesthesia or sedation and possibly post-procedure hospitalizations ***(Lee et al., 2018).***

Limitations for liver biopsy include invasive nature, complications, low level of individual's satisfaction and sampling variation. Pain and hypotension are major complications of liver biopsy and can lead to increased length of hospital stay and cost. Therefore performing continuous liver biopsy for follow-up is practically impossible ***(Hashemi et al., 2016)***.

The ideal non-invasive technique should be valid, painless, reproducible, easy-to-learn, easy-to-perform and cheap **(Shiha et al., 2016).** Non-invasive markers of fibrosis include serum markers which assess the biochemical properties of fibrosis and elastography devices which assess the physical stiffness of the fibrotic liver ***(El Saadany et al., 2016).***

Transient elastography (TE), also known as Fibroscan, is a well-validated method with advantages of a short procedure time (<5 min), immediate results, and the ability to perform the test at the bedside or in an outpatient clinic **(Sonderup et al., 2019)**.

Transient elastography (TE) measured by Fibroscan was the first of such elastography devices, followed by magnetic resonance elastography (MRE), acoustic radiation force impulse (ARFI) and shear wave elastography (SWE). In current clinical practice, TE is the most widely used elastography device for non-invasive assessment of liver fibrosis **(Chang et al., 2016)**.

TE has become widely present in clinical practice. The accuracy of TE for detection of fibrosis has been assessed extensively in a variety of liver diseases ***(Pavlov et al., 2016).***

Aim Of The Work

The study aimed to assess the role of transient elastography (fibroscan) in diagnosis and staging of liver fibrosis in chronic liver diseases among paediatrics in comparison to liver biopsy.

Chapter (1)

Liver Anatomy

The liver is the second largest (after the skin) organ in the human body and the largest gland (weighing an average of 1500 g). It lies under the diaphragm in the right upper abdomen and midabdomen and extends to the left upper abdomen. The liver has the general shape of a prism or wedge, with its base to the right and its apex to the left. It is pinkish brown in color, with a soft consistency, and is highly vascular and easily friable. Confusion surrounds the nomenclature of liver anatomy. The International Hepto-Pancreato-Biliary Association (IHPBA) terminology of liver anatomy and resections is followed by most liver surgeons **(Mobily et al., 2019).**

The surface of the liver is covered by visceral peritoneum (serosa), with a Glisson capsule underneath. At the porta hepatis, the Glisson capsule travels along the portal tracts (triads), carrying branches of the hepatic artery, the portal vein, and the bile ducts into the liver substance **(Crawford et al., 2017).**

Sinusoids are large-diameter capillaries lined by endothelial cells between rows of plates or cords of hepatocytes. Sinusoids also contain Kupffer cells of the reticuloendothelial system (RES). Each hexagonal lobule has a central portal tract with branches of the hepatic artery, the portal vein, and bile ducts, as well as a peripheral tributary of the hepatic vein. Bile canaliculi between hepatocytes drain into bile ductules in the portal triad. Bile ductules then form several orders of intrahepatic bile

ducts, in an arrangement resembling the twigs and branches of a tree **(Anand et al., 2018).**

Anatomic Divisions

Anatomically, the liver is divided into a larger right lobe and a smaller left lobe by the falciform ligament (see the image below). This division, however, is of no use surgically **(Rahimli et al., 2020).**

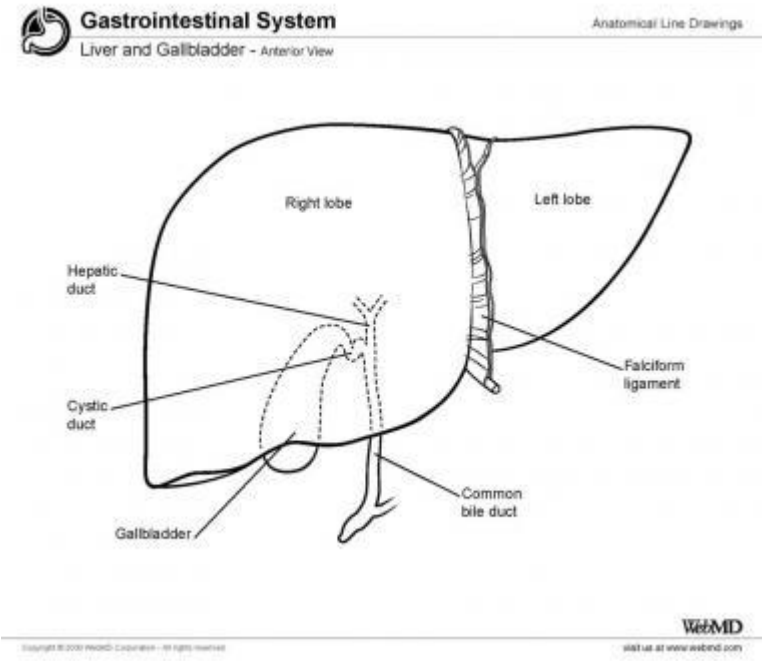

Fig (1): Liver and gallbladder, anterior view **(Nguyen et al., 2018)**

From a surgical point of view, the liver is divided into right and left lobes of almost equal (60:40) size by a major fissure (Cantlie's line) running from the gallbladder fossa in front to the IVC fossa behind. This division is based on the right and left branches of the hepatic artery and the portal vein (see the image below), with tributaries of bile (hepatic) ducts following. The middle hepatic vein (MHV) lies in Cantlie's line. The left pedicle (left hepatic artery [LHA], left branch of the portal vein,