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Research Article

Comparative Study between US & CT in Diagnosis Liver Cancer

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Abstract: Liver imaging in patients with a history of known or suspected malignancy is important because the liver is a common site of metastatic spread, especially tumours from the colon, lung, pancreas and stomach and in patients with chronic liver disease who are at risk for developing hepatocellular carcinoma. To compare between computed tomography scan and ultrasound in the diagnosis of liver cancer. A prospective, analytical, descriptive study deals with the abdominal ultrasound and computed tomography findings in liver cancer patients. In results the study shows that computed tomography (CT) was more accurate and high quality imaging modality than ultrasound in spite of their high cost. In conclusion the results were agree and compatible with literature. The results presented will serve as a baseline data for examinations in the department and hence in the whole Kingdom.
Keywords: Liver cancer imaging, computed tomography and ultrasonography

INTRODUCTION

Liver cancer or hepatic cancer is a cancer that originates in the liver. Liver tumors are discovered on medical imaging equipment (often by accident) or present themselves symptomatically as an abdominal mass, abdominal pain, yellow skin, nausea or liver dysfunction[1].

The leading cause of liver cancer is viral infection with hepatitis B virus or hepatitis C virus. The cancer usually forms secondary to cirrhosis caused by these viruses, for this reason, the highest rates of liver cancer occur where these viruses are endemic, including East-Asia and sub-Saharan Africa[2]. Liver cancers should not be confused with liver metastases, also known as secondary liver cancers, which are cancers that originate from organs elsewhere in the body and migrate to the liver. They are formed from either the liver itself or from structures within the liver, including blood vessels or the bile duct. Five year survival rates are 17% in the United States[3].

Primary liver cancer is the sixth most frequent cancer globally and the second leading cause of cancer death[4].

Diagnosis of liver cancer, many imaging modalities are used to aid in the diagnosis of primary liver cancer. For HCC these include sonography (ultrasound), computed tomography (CT) and magnetic resonance imaging (MRI). When imaging the liver with ultrasound, a mass greater than 2 cm has more than 95% chance of being HCC. The majority of cholangiocarcimas occurs in the hilar region of the liver, and often present as bile duct obstruction. If the cause of obstruction is suspected to be malignant, endoscopic retrograde cholangio pancreatography (ERCP), ultrasound, CT, MRI and magnetic resonance cholangio pancreatography (MRCP) are used[5].

The treatment of liver cancer differs according to the cancer e.g. hepatocellular carcinoma surgical resection is often the treatment of choice for non-cirrhotic livers. Increased risk of complications such as liver failure can occur with resection of cirrhotic livers. 5-year survival rates after resection has massively improved over the last few decades and can now exceed 50%[6]. Liver transplantation can also be used in cases of HCC where this form of treatment can be tolerated and the tumor fits specific criteria (such as

the Milan criteria). Less than 30-40% of an individual with HCC is eligible for surgery and transplant because the cancer is often detected late stage[6].

Regarding Cholaniocarcinoma, resection is an option in cholaniocarcinoma, but less than 30% of cases of cholaniocarcinoma are resectable at diagnosis. After surgery, recurrence rates are up to 60%[7 -8]. Liver transplant may be used where partial resection is not an option, and adjuvant chemoradiation may benefit some cases[9].

Regarding hepatoblastoma, removing the tumor by either surgical resection or liver transplant can be used in the treatment of hepatoblastoma. In some cases surgery can offer a cure. Chemotherapy may be used before and after surgery and transplant[10]. CT-Scan is the process of creation cross-sectional tomographic (slice) of any part of the body which includes a thin beam of X-rays passes through the body in the axial plane chosen for study as the X-ray tube moves in a continuous around the patient. Electronic detectors placed opposite the x-ray tube on the other side of the body convert the exiting beam into electrical pulses, the intensity of which depends on the amount of the x-ray beam that was not absorbed by the intervening tissues. This information is then conveyed to computer, which calculates the x-ray absorption for each voxel and creates the final CT-image. CT-scan used for much body application, it provides diagnostic information that cannot be achieved with any other method[11].

An ultrasound scan is a medical test that uses high-frequency sound waves to capture live images from the inside of your body. An ultrasound allows your doctor to see problems with organs, vessels and tissues—without needing to make an incision. Unlike other imaging techniques, ultrasound uses no radiation, so it is the preferred method for viewing a developing fetus during pregnancy[12].

According to the Radiological Society of North America, your doctor may order an ultrasound if you are experiencing pain, swelling, or other symptoms that require an internal view of your organs. An ultrasound can provide a view of the: bladder, brain (in infants), eyes, and gallbladder, kidneys, liver, ovaries, and pancreas, spleen, thyroid, testicles, uterus and blood vessels[12].

An ultrasound is also a helpful way to guide surgeons' movements during certain medical procedures, such as biopsies. Fasting for eight to 12 hours before your ultrasound is necessary, especially if your abdomen is being examined. Undigested food can block the sound waves, making it difficult for the technician to get a clear picture. For an examination of the gallbladder, liver, pancreas, or spleen, you may be told to eat a fat-free meal at the evening before your test and then to fast until the procedure. Be sure to tell your doctor about any prescription drugs, over-the-counter medications, and herbal supplements that you take before the exam[12].

OBJECTIVE

To compare between computed tomography scan and ultrasound in the diagnosis of liver.

MATERIALS & METHODS

A prospective, analytical, descriptive study deals with the abdominal ultrasound and computed tomography findings in liver cancer patients, all patients who had been confirmed or suspected liver mass came to radiology department at the time of this study were included. Sample frame was comprised of fifty patients with signs and symptoms of liver mass were scanned by ultrasound and computed tomography. Data was collected in data collection sheet which was designed to include all variables to satisfy the study and ultrasound and computed tomography scanning reports: Patient Preparation: bowel gas may be an obstacle for scanning the abdomen by causing a total reflection of the ultrasound. Usually the examination is carried out with the patient in supine position. The data have been analyzed by excel using the various statistic computerize methods. For data presentation dummy tables and figures has been used.

ABDOMINAL SCANNING GUIDELINES AND PROTOCOLS

The area of interest in the abdomen was completely evaluated in at least two scanning planes. Surveys were used to set correct imaging techniques, to rule out pathologies, and to recognize any normal variants. Full abdominal surveys began with aorta, followed by the inferior vena cava and the liver then the rest of abdominal organs and associated structures.

CT SCANNER

CT scan of the liver and biliary tract the patients remove any clothing, jewelry, or other objects that may interfere with the procedure, for contrast, an intravenous (IV) line was started in the hand or arm for injection of the contrast dye. For oral contrast, a liquid contrast was given for preparation to swallow then lie on a scan table that slides into a large, circular opening of the scanning machine (Gantry). Pillows and straps were used to prevent movement during the procedure. As the scanner begins to rotate around patients, X-rays will pass through the body for short amounts of time. The X-rays absorbed by the body's tissues will be detected by the scanner and transmitted to the computer. The computer will transform the information into an image to be interpreted by the radiologist.

ETHICAL CONSIDERATION:

Especial verbal consideration informed consent was obtained from the patient for publication of this case report and any accompanying images.

RESULTS & DISCUSSION

Gender distribution: From this study we see that males were 39(78%) and the females were 11 (22%). Males were suffering from liver tumor more than the female's .This results are in agreement with males affection predominates is study done by Eman. I.M [13]. Age distribution: 16 patients (32%) of our patients have liver tumors in the age between (56- 65) year (8 patients were male and 4 patients were Females), that mean patients are more affected by liver tumors in this age. This result is comparable to study done by Eman. I.M[13]

Tumors**:** From (Table 7) noted that (7 patients 14%) of our patients have liver cirrhosis, (27pateints 54%) have hepatocellular carcinoma, (5 patients 10%) have hepatic Mass and (6 patients 12%) have other liver masses. This result is disagreeing to study done by Eman.I.M[13].

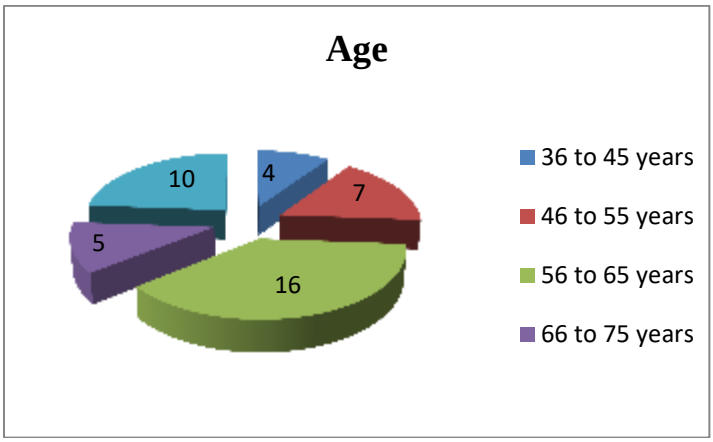

Fig 1: Frequency distribution of patients according to age

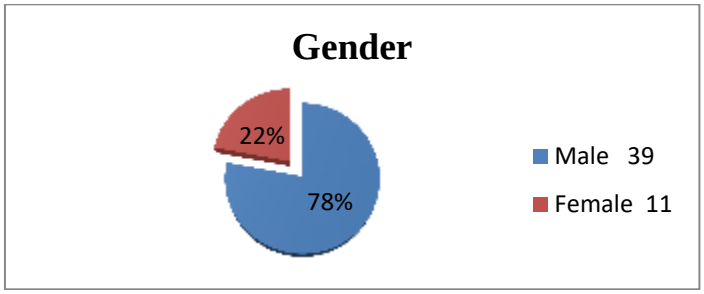

Fig 2: Frequency distribution of patients according to sex

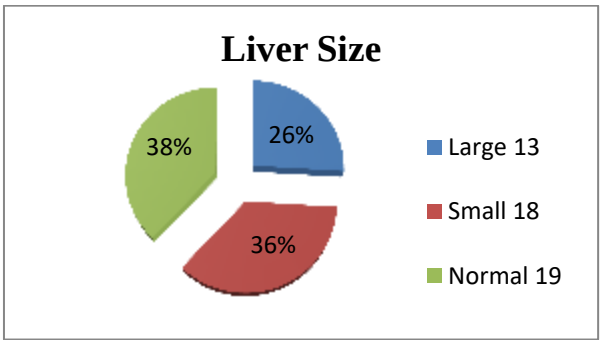

Fig 3: Frequency distribution of patients according to liver size

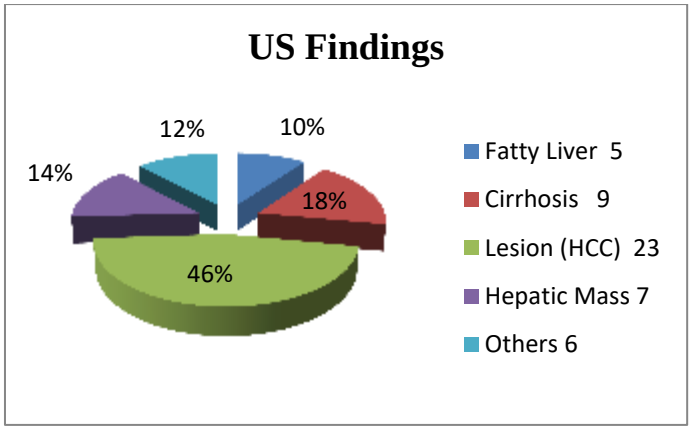

Fig 4: Frequency distribution of patients according to US findings

Table 1: Frequency distribution of patients according to CT liver echogenicity

No	Age	Frequency	Percentage
1	Hyper echogenicity	9	18%
2	Hypo echogenicity	6	12%
3	Mixed echogenicity	35	70%
Total		50	100%

Table 2: Frequency distribution of patients according to CT findings

No	Age	Frequency	Percentage
1	Fatty Liver	5	10%
2	Cirrhosis	7	14%
3	Lesion (HCC)	27	54%
4	Hepatic Mass	5	10%
5	Other	6	12%
Total		50	100%

Table 3: Frequency distribution of patients according to US liver echogenicity

No	Age	Frequency	Percentage
1	Hyper echogenicity	19	38%
2	Hypo echogenicity	11	22%
3	Mixed echogenicity	20	40%
Total		50	100%

CONCLUSION

The goal of liver imaging in masses patients includes liver tumour detection and characterization. Patients with extra-hepatic malignancy undergo survey examinations to exclude the presence of hepatic and extra-hepatic metastases and to evaluate the extent of local involvement. This metastasis survey should be done with contrast-enhanced CT, MRI being reserved for those patients unable to receive intravenous contrast or with a fatty liver. Patients with hepatic metastases being considered for metastasectomy undergo a staging examination usually with contrast-enhanced CT. Patients with chronic liver disease at risk for developing hepatocellular carcinoma undergo periodic liver screening with US. CT-scan has more efficiency and accuracy than ultrasound in the diagnosis of liver tumors.

RECOMMENDATION

If the patients have no contraindications for CT-Scan then should be examined with it because the CT-Scan image provides good anatomy details and it is more accurate than ultrasound examination. The pregnancy woman whom suffering from liver tumors should not be examined by CT-Scan because of its affection on the fetus.

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