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# Evaluation of Abdominal Mass Using Ultrasound and Computed Tomography

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***Abstract:****The objective of this study is to evaluate the role of ultrasound and computed tomography in diagnosis and management of abdominal masses, study depend on the reports results, of 50 patients of abdominal mass the most common affected age was between (41-50) years old (13) patients 26%. Most common finding was the liver mass in (26) patients 52% and the kidney mass in (7) patients was14%, the classification in ultrasound was in (1) patient was 2% and in computed tomography was in (12) patients 24%, the pathology in ultrasound was diagnosed in (5) patients 10% and in computed tomography was diagnosed in (36) patients 72%.Study achieved that computed tomography was more accurate than ultrasound in detection of morphological features, calcifications, presence or absent of fat, infiltration into the surrounding organs, tumoral necrosis, regional lymphadenopathy and distant metastases.*

***Key words:****Abdominal mass, Computed tomography, Ultrasound.*

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## I. Introduction

An abdominal mass commonly detected on routine physical examination, is a localized swelling in one abdominal quadrant. This sign develops insidiously and may represent an enlarged organ, a neoplasm, an abscess, a vascular defect, or a fecal mass. a palpable abdominal mass is an important clinical sign. [1] Masses in the abdomen are often described by their location. The abdomen is divided into four sections called quadrants. An abdominal mass may occur in the right upper quadrant, left upper quadrant, right lower quadrant, or left lower quadrant. The stomach is also divided into two sections: the epigastric section and the periumbilical section. The periumbilical section is located below and around the umbilical ; the epigastric section is located above the umbilical and below the ribs.A person with an abdominal mass may notice weight gain and symptoms such as abdominal discomfort, painand bloating. [2] The most common disorders responsible for abdominal masses in each of the four abdominal quadrants are:aorticaneurysm, Cholecystitis, gallbladder, gastric or hepatic carcinoma, hydronephrosis, pancreatic abscess or pseudo cysts, renal cell carcinoma and splenomegaly, in the right and left abdominal quadrants. Bladder distention, colon cancer, crohn's disease, ovarian cyst, uterine leiomyomas, diverticulitis and volvulus, in the right and left lower abdominal quadrant. [3]

Abdominal masses can be sub-divided into inflammatory, cystic and neoplastic. Disease of appendix, the gallbladder, thepancreas, and diverticular diseases of the colon can all, after the acute phase of thedisease, give rise to the development of abdominal mass, cystic lesions of the pancreas and the liver and the mesentery can present with a mass on physicalexamination. tumors of the pancreas and colon are the most common causes of tumors giving rise to mass as the primary presenting symptom. An aneurysm of the abdominal aorta is the only clinically relevant example of a vascular cause of an abdominal mass. [4]

A general physical examination as well as directed assessment of the mass complements the history. Scleral icterus or jaundice suggests liver infiltration versus biliary obstruction from a bile duct or pancreatic tumor. Temperature higher than 38*C is consistent with an infectious or inflammatory process such as abdominal abscess. Lower fevers may accompany some neoplasms. if inflammatory. Lymphadenopathy raises concern for metastatic malignancy. Palpable supraclavicular or periumbilical nodes are found with gastric cancer. rectal examination defects approximately half of all rectal neoplasm. Occult fecal blood is highly predictive of malignancy in a patient with a known abdominal mass. [5] Tissue must be obtained to distinguish accurately between a malignant and a noncancerous etiology of a radiographically or endoscopically. [5] Laboratory studiesPlays minor rules in the evaluation of an unexplained abdominal or rectal mass. a complete blood count can test for anemia due to blood loss or chronic disease or for leukocytosis with inflammation. Liver chemistries may be abnormal with some hepatic masses. Serum tumor markers may provide adjunctive information in the diagnostic workup. CA 19-9 and CA 242 are reasonably sensitive for detecting pancreatic adenocarcinoma but are not specific. Carcinoembryonic antigen is elevated with colon cancer as well as in

benign liver and pancreatic disease. Alpha-fetoprotein is secreted by larger hepatocellular carcinomas. If ascites is present, cytologic examination may reveal malignant cells. High levels of ascetic triglycerides indicates chylous ascites, possibly due to lymphoma.[6]

**Diagnostic evaluation:**

Ultrasound and computed tomography have each been successfully in evaluating patients with abdominal mass, ultrasound has the advantage of being less costly and is preferred by some as the initial imaging exam it is also more wildly available but remains more operator dependent than competed tomography. Relatively thin patients may be better evaluated with ultrasound. Obese patients frequently have pathology better resolved with computed tomography. The inability of ultrasound to image through bowel gas may be a significant limitation relative to computed tomography for some abdominal mass. [7] Computed tomography is superior to sonography in diagnosis and management of abdominal masses. The exact origin of mass, size, shape and localization can be done with computed tomography. Contrast enhanced computed tomography scan helps in better localization, determining exact size of mass and degree of vascularity of the mass. Abdominal lymphadenopathy can also be better assessed. [8]

Ultrasound elastography is expected to be a useful adjunct technology for the detection of tumors, for the precise determination of the extent of cancer, for the differential diagnosis and confirmation of benign and malignant lesions, and for guidance during biopsy procedures. [9]

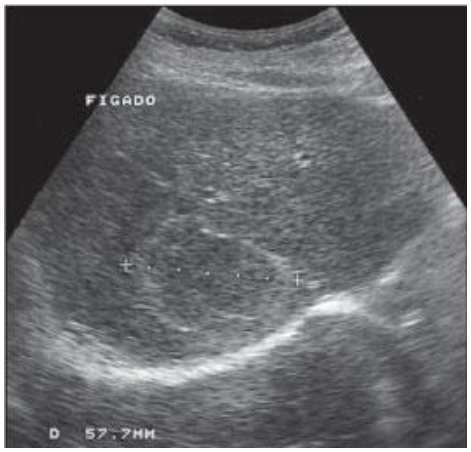


**Figure1.**Ultrasound shows hepatichemangioma with central Echogensity


**Figure 2** axial CT arterial phase scan shows Liver hemangioma.

## II. Materials and Methods

**Material**:Equipment: Data collection sheets. computer tomography machines of complete capabilities (GE optima 16 slice – 120-140 Kvp, and ultrasound Philips machine.

**Method:**The study done during the period from 27 SaturdayJuly 2019 to 5Saturday October 2019.The design used in this study was a prospective analytical cross-sectional study.

**Inclusion criteria in the case:**Patients above 1 yrs.and below 80yrs, All positive CT & USG studies with abdominal masses.
**Exclusion criteria in the case:** Patients below 1yr and above 80 yrs. Patients who are allergic to contrast.
**Sample size and type**: The data of this study collected from the 50 objects, of them was selected from CT abdomen images with patient who only have abdominal masses, the case included patient's age (18-80) years old.
**Methods of data collection and technique:** Using the data collecting sheet to collect the data **Variables of data collection:** The data of this study collected using the following variables: Patient gender, patient age, Morphological characteristics in CT and US, Classification in CT and US and diagnosed pathology in CT and US.
**Methods of data analysis:** The data analyzed using SPSS program.
**Ethical approval:** Ethical approval has been granted from the hospital and the department of radiology this did not include or disclose any [ID] information concerning the patient. Informed consent was obtained from all individual participants; included in the study.

## III. Result

**Table 1:** The frequency distribution of the age groups in abdominal masses (the majority was between 51 -50 years)

| Age | Frequency | Percent |
|---|---|---|
| 0-20 | 2 | 4 |
| 21-30 | 1 | 2 |
| 31-40 | 10 | 20 |
| 41-50 | 13 | 26 |
| 51-60 | 12 | 24 |
| 61-70 | 6 | 12 |
| 71-80 | 6 | 12 |
| Total | 50 | 100 |

**Table 2:** Distribution of The site of the mass and the frequency on US

| Site | Frequency | Percent |
|---|---|---|
| LI | 26 | 52 |
| UM | 3 | 6 |
| CO | 2 | 4 |
| RIF | 3 | 6 |
| PA | 2 | 4 |
| RSM | 1 | 2 |
| GB | 2 | 4 |
| K | 7 | 14 |
| PE | 1 | 2 |
| ST | 1 | 2 |
| RP | 1 | 2 |
| HC | 1 | 2 |
| Total | 50 | 100 |

**Table 3:**Distribution of the Echogensity of the mass and the frequency on US

| Echogensity | Frequency | Percent |
|---|---|---|
| Hypo | 24 | 48 |
| Echogenic | 3 | 6 |
| Hyper | 3 | 6 |
| Heterogonous | 8 | 16 |
| Isoechoic | 1 | 2 |
| Anechoic | 1 | 2 |
| Missing | 10 | 20 |
| Total | 50 | 100 |

**Table 4:** Distribution of the outline of the mass and the frequency on US

| Outline | Frequency | Percent |
|---|---|---|
| Coarse | 2 | 4 |
| Irregular | 21 | 42 |
| Regular | 17 | 34 |
| Missing | 10 | 20 |
| Total | 50 | 100 |

**Table 5:** Distribution of the classification and the frequency on US

| Classification | Frequency | Percent |
|---|---|---|
| Yes | 1 | 2 |
| No | 49 | 98 |
| Total | 50 | 100 |

**Table 6:** Distribution of the pathology and the frequency on US

| Pathology | Frequency | Percent |
|---|---|---|
| Yes | 5 | 10 |
| No | 45 | 90 |
| Total | 50 | 100 |

**Table 7:** Distribution of the site of the mass and the frequency on CT

| Site | Frequency | Percent |
|---|---|---|
| LI | 22 | 44 |
| CO | 1 | 2 |
| RIF | 5 | 10 |
| PA | 2 | 4 |
| RSM | 1 | 2 |
| GB | 2 | 4 |
| K | 7 | 14 |
| ST | 1 | 2 |
| RP | 1 | 2 |
| HC | 1 | 2 |
| CE | 1 | 2 |
| LI and K | 2 | 4 |
| PE and HC | 1 | 2 |
| DU and LI | 1 | 2 |
| EPI | 1 | 2 |
| MES | 1 | 2 |
| Total | 50 | 100 |

**Table 8:** Distribution of the appearance of the density and the frequency on CT

| Density | Frequency | Percent |
|---|---|---|
| Hypo | 25 | 50 |
| Hyper | 3 | 6 |
| Heterogeneous | 15 | 30 |
| Missing | 7 | 14 |
| Total | 50 | 100 |

**Table 9:** Distribution of the outline of the mass and the frequency on CT

| Outline | Frequency | Percent |
|---|---|---|
| Irregular | 28 | 56 |
| Regular | 6 | 12 |
| Lobulated | 3 | 6 |
| Smooth | 5 | 10 |
| Nodular | 1 | 2 |
| Missing | 7 | 14 |
| Total | 50 | 100 |

**Table 10:** Distribution of the classification and the frequency on CT

| Classification | Frequency | Percent |
|---|---|---|
| **Yes** | **12** | **24** |
| **No** | **38** | **76** |
| **Total** | **50** | **100** |

**Table 11:** Distribution of the pathology and the frequency on CT

| Pathology | Frequency | Percent |
|---|---|---|
| **Yes** | **36** | **72** |
| **No** | **14** | **28** |
| **Total** | **50** | **100** |

## IV. Discussion

The study done during the period from 27 Saturday July 2019 to 5 Saturday October2019.The study showed that from these features the computed tomography had the higher percent for the accurate diagnosis of the mass than ultrasound 72%, 10% respectively.

## V. Conclusion

The main objective of this study was to out the accurate evaluation of abdominal mass using ultrasound and computer tomography, the majority of the cases was diagnosed byusing computed tomography more accurate than ultrasound in detection of morphological features, calcifications, presence or absent of fat, infiltration into the surrounding organs, tumoral necrosis, regional lymphadenopathy and distant metastases.

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