ORIGINAL RESEARCH PAPER

Radiodiagnosis

ROLE OF CT IN EVALUATION OF PEADIATRIC ABDOMINAL TUMOURS

KEY WORDS: Pediatric Abdominal Tumors, Multidetector Computed Tomography

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ABSTRACT

Aim: To assess the role of computed tomography in the evaluation of pediatric abdominal tumors.

METHODS AND METHODS: CT evaluation of 40 patients in the age group 0 to 18 years with suspected abdominal mass was done. The lesions were evaluated in terms of location, organ of origin, CT characters like attenuation, enhancement, necrosis, cystic changes, calcifications and extensions. Based on the age of the patient and the CT characters, provisional and differential diagnoses were given.

RESULTS: Majority of patients in our study belonged to infantile age group (<1 year). Neuroblastomas were the most common tumor in our study followed by Wilms' tumor. Malignant tumors outnumbered benign tumors.

CONCLUSIONS: Computed tomography is a very sensitive imaging modality. It is fast, reliable, significantly accurate method for localizing and characterizing various tumors arising from pediatric abdomen. It helps in narrowing differentials and arriving at a final diagnosis in most cases.

INTRODUCTION:

A broad spectrum of tumors can involve the pediatric abdomen originating from various organs and can be benign or malignant. The diagnosis is suggested mainly by the patient age and imaging appearance of the lesion, including its location, shape and internal architecture. Various tumors are common in certain age groups- neonatal, infantile, early childhood and adolescence. Multidetector computed tomography (MDCT) with its multiplanar reconstruction is an excellent imaging modality to locate and characterize these lesions. It helps to develop a differential diagnosis, based on CT characteristics and patient age.

OBJECTIVES:

- To assess the role of CT in the evaluation of pediatric abdominal tumors - in localization and characterization.

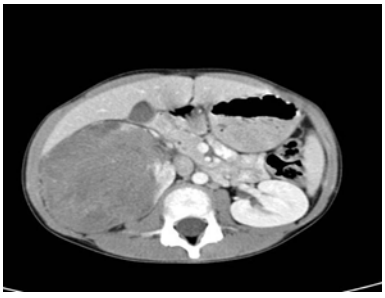
MATERIALS AND METHODS:

- 40 patients in the age group 0 to 18 years with clinically diagnosed abdominal mass were referred for computed tomography in our department of Radiodiagnosis at MGM Hospital, kamothe, Navi mumbai.
- The lesions were evaluated in terms of location, organ of origin, CT characters Including attenuation, enhancement, necrosis, cystic changes, calcifications and extensions.
- Based on the age of the patient and the CT characters, provisional and differential diagnoses were given.

DISCUSSION :

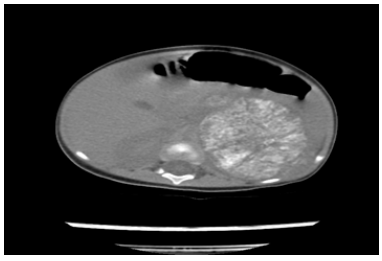
- In our study, Majority of patients in our study were below 1 year of age (18) followed by 1-5 years age group (11)
- There was near equal gender distribution with 22 males and 18 females.
- Of the 40 cases, majority (11) were neuroblastomas, predominantly in infants (< 1 year). It was followed by Wilms tumor (8) especially in the early childhood.
- Of the total cases of renal masses, 8 were Wilms tumor, followed by mesoblastic nephromas (2) Of the 8 cases diagnosed with liver masses, 5 were hemangiomas, followed by hepatoblastomas (4). One case of extra adrenal ganglioneuroblastoma was noted. Two cases of ovarian teratoma and 5 cases of sacrococcygeal teratomas were noted. Two cases of splenic hamartoma noted.
- Malignant pathologies were 28 and 12 cases appeared to be benign
- Computed tomography was 100 % sensitive in detecting calcifications.
- CT with multiplanar reformation was an excellent imaging modality with high diagnostic accuracy, for:

1. Localizing the lesions, with respect to organ of origin.
2. Characterization, in terms of enhancement, identifying necrotic areas and calcifications, for which CT was 100 % sensitive.
3. Extensions and mass effect on adjacent structures.



CT of the abdomen with oral and intravenous contrast demonstrates a very large heterogeneous mass arising from the right kidney, and displacing the remaining renal parenchyma anteromedially. The mass contains mixed solid and cystic areas only only marginally enhances.

On these images there is no convincing evidence of spread into adjacent structures. There is no convincing involvement of the renal vein or IVC. No convincing nodal or distant metastatic disease in the portions imaged.



There is a heavily calcified well-defined oval-shaped soft tissue mass in left suprarenal area displacing the left kidney downward. There are enlarged regional retroperitoneal lymph nodes. No evidence of intraspinal extension. It is partially encasing the aorta and the renal vessels. There is rounded hypodensity in segment four of the liver raising the possibility of liver metastasis. The cuts on the lower chest showed multiple heavily calcified pleural based and

pulmonary nodules/metastasis. As well there are anterior mediastinal calcified masses. The spleen, pancreas appear unremarkable. Apart from the adjacent mass effect. No biliary dilatation No ascites.

Stage IV disease with heavily calcified left suprarenal tumour, multiple pulmonary and pleural-based metastases. On top of differential diagnosis is neuroblastoma.

AGE	MALE	FEMALE	TOTAL
< 1 YR	10	8	18
1-5 YRS	7	4	11
5-10YRS	3	2	5
10-18YRS	2	4	6
	22	18	40

PATHOLOGY	BENIGN	MALIGNANT
WILMS TUMOUR		8
MESOBLASTIC NEPHROMA	2	
NEUROBLASTOMA		11
EXTRA ADRENAL GANGLIONEUROMA	1	
HEPATOBLASTOMA		4
HEMANGIOMA	5	
OVARIAN TERATOMA	2	
SPLENIC HAMARTOMA	2	
SACRO-COCCYGEAL TEARATOMA		5
TOTAL	12	28

ADVANTAGES:

Computed tomography is relatively fast technique and in most cases do not require use of sedation or anesthesia.

LIMITATIONS:

Computed tomography involves use of ionizing radiation, which is especially hazardous in the pediatric life, leading to development of biological effects including carcinogenesis in later age group. However this risk is significantly reduced by using appropriate factors and safety procedures.

CONCLUSIONS:

The pediatric patient with an abdominal mass needs rapid clinical evaluation and appropriate management, which is surgical in majority of cases. Age and imaging appearances provide valuable information for developing differential diagnosis. Multidetector computed tomography (MDCT) is a very sensitive imaging modality with high diagnostic accuracy. It is fast, reliable, significantly accurate method for localizing and characterizing various tumors arising from pediatric abdomen. It helps in narrowing differentials and arriving at a final diagnosis in most cases. It also provides significant information for operative management.

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