Radiological Evaluation of Renal Masses

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Abstract

Renal masses are a broad group of lesions from benign to malignant. The goal of imaging is to differentiate malignant renal masses from benign masses. This study intends to evaluate the role of radiological modalities like X-ray, IVP, USG, CT Scan, MRI, Interventional procedures etc. in the evaluation of renal masses and to review the imaging spectrum of renal masses on the various imaging modalities and also decide radiological investigation approach for renal masses. The present study is carried out on 50 cases of renal masses, in the duration of two years. Most common affected Age group is 40-50 years. Mostly the incidence is higher in males with benign renal masses are commoner. Most common malignant renal masses are Renal cell carcinoma, amongst them Clear cell RCC are most common. Ultrasound was 100% accurate in diagnosing cystic lesion. CT Scan is more accurate than USG for detection and characterization of the benign and malignant solid renal masses.

Keywords: Renal masses, benign renal mass, malignant renal mass, RCC, CT scan, USG, IVP.

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Introduction

Renal masses are heterogeneous group of tumours ranging from benign to malignant masses. Most renal masses are discovered incidentally and are asymptomatic at presentation. Renal masses have been a known entity for long and constitute more than 50% of abdominal masses in children as well as in adults. [1,2]

The goal of imaging is to differentiate malignant renal masses from benign masses, although in many cases it may not be possible. [3]

- First determine whether the lesion is cystic or solid.
- If it is not cystic, look for macroscopic fat, which means that it is a benign mass like angiomyolipoma or xanthogranulomatous pyelonephritis.
- Lesion with solid component with enhancement without fat, means it is malignant tumour like renal cell carcinoma, Oncocytoma, Transitional cell carcinoma, Lymphoma, Wilm's tumour, Metastasis, Sarcoma, Adenoma.

This study intends to evaluate the role of radiological modalities like X-ray, IVP, USG, CT Scan, MRI, Interventional procedures etc. in the evaluation of renal masses and to review the imaging spectrum of renal masses on the various imaging modalities and also decide radiological investigation approach for renal masses, so by that way we can diagnose the mass early and can give proper guidance to referring doctor for further management of patients and prognosis can be improved. [4–6]

Aims and objectives

1. To assess the role of various radiological modalities like - X-ray, USG, CT Scan, IVP, MRI, Interventional procedure etc. in the evaluation of renal masses.
2. To study imaging features of various types of renal masses on different radiological modalities
3. To note advantages, disadvantages and limitation of various radiological modalities in evaluation of renal masses.
4. To suggest guideline for imaging of renal masses on the basis of results
5. To offer guidance to referring doctors in making further management decisions

Materials and Methods

Sample Size= 50 Patients

Design of Study= Observational Study

Type of Study= Cross-Sectional Study
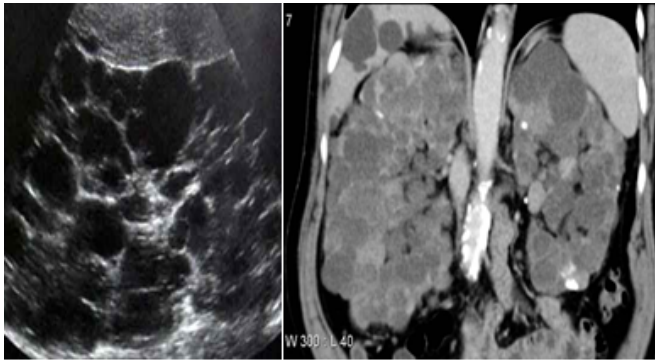
Duration of Study= 2 Years (May 2019 To May 2021)
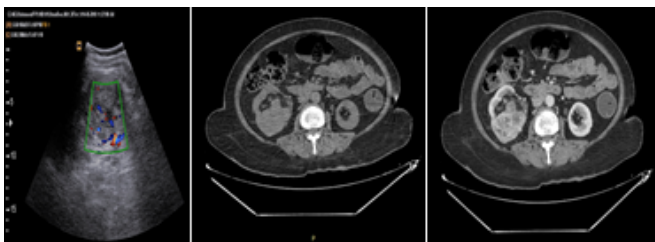
Figure 3: Polycystic Kidney Disease

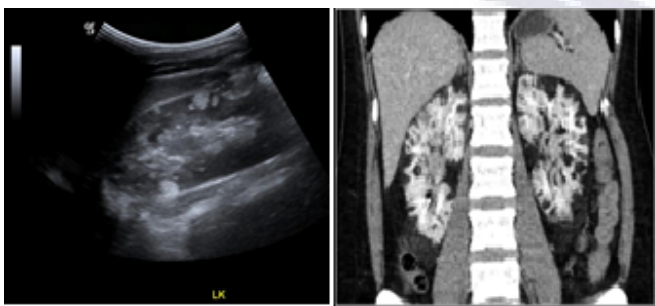**Figure 4: Renal Cell Ca**

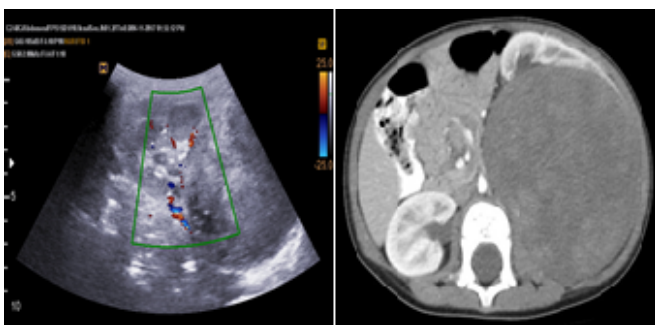**Figure 1: Angiomyolipoma**

Figure 2: Wilm's Tumour

Place of Study= Civil Hospital, P.D.U. Medical College, Rajkot

Consent for Participation in Study= Yes

- Consent for participation in the study will be taken from the patient.
- The indication and details of the radiological procedure will be explained to the patient.
- A written consent will be obtained either from patient or his/her relatives.
- Each patient would undergo X-ray, USG, CT scan, MRI, IVP as indicated.
- Findings of different imaging modalities will be correlated with surgical & clinical outcomes whenever available.

Inclusion criteria

- Cases in which clinically renal masses are suspected.
- Cases of renal masses identified radiologically during the study period.

Results

Conclusion

- Most common affected Age group is 40-50 years.
- Incidence is higher in males.
- Benign renal masses are more common than Malignant.
- Most common benign renal mass is simple cyst.
- Most common malignant renal masses are Renal cell carcinoma, amongst them Clear cell RCC are most common.
- Two third of total solid lesions are malignant in nature.
- Ultrasound was 100% accurate in diagnosing cystic lesion.
- CT Scan is more accurate than USG for detection and characterization of the benign and malignant solid renal masses.
- Thus as per my aims and objectives for suggesting guideline for imaging of renal masses, only combination approach of USG and CECT (non-contrast CT If renal function is altered) are most accurate imaging modalities for imaging final diagnosis of various renal masses.

References

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Table 1: Distribution According to Age of the Cases (N=50)

Years	No. Of cases	Percentage
00-10	6	12%
11-20	3	6%
21-30	3	6%
31-40	7	14%
41-50	14	28%
51-60	10	20%
>60	7	14%
Total	50	100%

Table 2: Distribution According to Sex of the Cases (N=50)

Sex	No. Of cases	Percentage
Female	19	38%
Male	31	62%
Total	50	100%

Table 3: Distribution Accordingto Plain X-Ray KUB & Chest Findings

Radiological Finding	No. Of Cases	Percentage
Soft Tissue Mass	24	48%
Calcification	7	14%
Metastasis In Chest	2	4%

Table 4: Distribution According to IVU Findings

IVU Findings	No. Of Cases	Percentage
Nonfunctioning Kidney	3	6%
Stretching Of Calyces	5	10%
Displacement Of Calyces	29	58%
Distortion Of Calyces	24	48%

Table 5: Distribution According to USG Finding

USG Findings	No. Of Cases	Percentage
Mixechogenic	24	48%
Hyperechoic	2	4%
Anechoic (Cystic)	20	40%
Hypoechoic	8	16%

Table 6: Distributionof Cystic Lesion According to Nature of Neoplasm

Nature of neoplasm	Cystic	Percentage
Benign	22	100%
Malignant	0	0
Total	22	100%

Table 7: Distributionof Solid Lesion According to Nature of Neoplasm

Nature of neoplasm	Solid	Percentage
Benign	9	33%
Malignant	19	67%
Total	28	100%

Table 8: Distribution of Malignanat Solid Lesion According to Tissue of Origin

	Perenchymal	Nonperechymal	Total
Malignant	18	1	19
Percentage	95%	5%	100%

Table 9: Distributionof Malignant Renal Mass According to Histological Type

Histological Type	No. Of Cases	Total=14
Clearcell RCC	12	84%
Papillary RCC	1	8%
Chromophobe RCC	1	8%
Collecting Duct RCC	0	0%
Unclassified RCC	0	0%

Table 10: Distribution Accordingto CT Scan Finding

	No. of cases	Percentage
Water density	17	34%
Fat density	5	10%
Hypodense	13	26%
Mix density	17	34%
Hyperdenseity	2	4%

Table 11: Accuracy of Ultrasound in the Pathological Diagnosis of Renal Masses

Types Of Pathology	Correct Diagnosis	Wrong Diagnosis	Negative Study	Nonspecific Dignosis	Total	Accuracy
Inflammatory	4	-	-	1	5	80%
Neoplastic Benign Malignant	7 16	1 1	- -	1 2	9 19	77% 84%
Miscellaneous	16	-	-	1	17	94%
Total	43	2	0	5	50	86%

Table 12: Accuracy of Ct in the Pathological Diagnosis of Renal Masses

Types Of Pathology	Correct Diagnosis	Wrong Diagnosis	Negative Study	Nonspecific Dignosis	Total	Accuracy
Inflammatory	5	-	-	-	5	100%
Neoplastic Benign Malignant	8 17	1	- -	1 1	9 19	88% 90%
Miscellaneous	17	-	-		17	100%
Total	47	1	-	2	50	94%

Table 13: Distribution of Final Diagnosis

Pathology	No. Of Cases	Percentage
Renal Cell Carcinoma	14	28%
Simple Cyst	8	16%
Angiomyolipoma	5	10%
Polycystic Disease	4	8%
Wilm's Tumor	2	4%
Adenoma	2	4%
Abscess	4	8%
Acute Pyelonephritis	1	2%
Complex Cyst	2	4%
Transitional Cell Carcinoma	1	2%
Mesoblastic Nephroma	1	2%
Hematoma	2	4%
Urinoma	1	2%
Lymphoma	1	2%
Xanthogranulomatous Pyelonephritis	1	2%
Metastasis	1	2%
Total	50	100%

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