Usefulness of Contrast Enhanced Computed Tomography in the Evaluation of Retroperitoneal Masses

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Abstract- Primary retroperitoneal masses constitute a heterogeneous group of uncommon lesions and represent a challenge due to overlapping imaging findings.
The main imaging methods used for staging and surgical planning, as well as for selecting the biopsy site and guiding the biopsy procedure, are computed tomography and magnetic resonance imaging. In most cases, the treatment is challenging, because of the size of the lesions, vascular involvement or involvement of adjacent organs.
Aims: Discuss CT features of various retroperitoneal masses with the help of contrast study which would help in narrowing down of differential diagnosis.
Discuss potential limitations
Materials And Methods: Hospital based observational cross-sectional study was carried out among patients referred based on clinical indications to the department of radiodiagnosis at KLEs, Dr. Prabakar Kore hospital & MRC Belgaum for CT abdomen and pelvis contrast study.
Results: Based on the CT characteristics, lesions were divided into neoplastic & non-neoplastic lesions and enhancement patterns of various lesions are evaluated.
Conclusion: Good knowledge of characteristic CT findings of benign & malignant conditions and their role in staging, therapeutic planning and follow-up in the setting of malignancy is essential for optimal patient care.

INTRODUCTION

Retroperitoneal tumours constitute a heterogeneous group of uncommon lesions and represent a challenge due to overlapping imaging findings.
The main imaging methods used for staging and surgical planning, as well as for selecting the biopsy site and guiding the biopsy procedure, are computed tomography and magnetic resonance imaging.
It determines the epicentre of tumour, size, tumour composition, extent, vascularity and effects on adjacent structures and thus aids in treatment planning.
Practical approach to the main imaging features with a view to the differential diagnosis can guide in clinical management.

AIMS AND OBJECTIVES:

Discuss CT features of various retroperitoneal masses with the help of contrast study which would help in narrowing down of differential diagnosis and to correlate with histopathological findings.

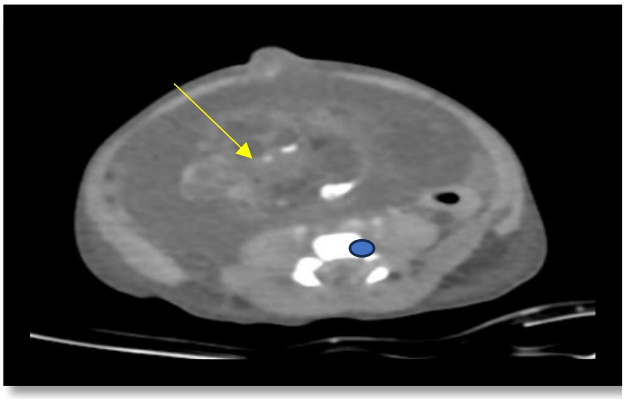
Inclusion criteria:
Patients who came to department of radiology in suspicion of retroperitoneal mass were included in the study.
Symptoms included were abdominal swelling or increase in girth, early satiety, abdominal discomfort, palpable mass, abdominal distension, diffuse abdominal pain, epigastric pain, diarrhea, constipation, feeling of fullness or heaviness in the abdomen.
No limitation with age group.

Exclusion criteria:
History of allergy to contrast agent.
Known case of chronic kidney disease or patients with creatinine level > 1.6 were excluded from the study.

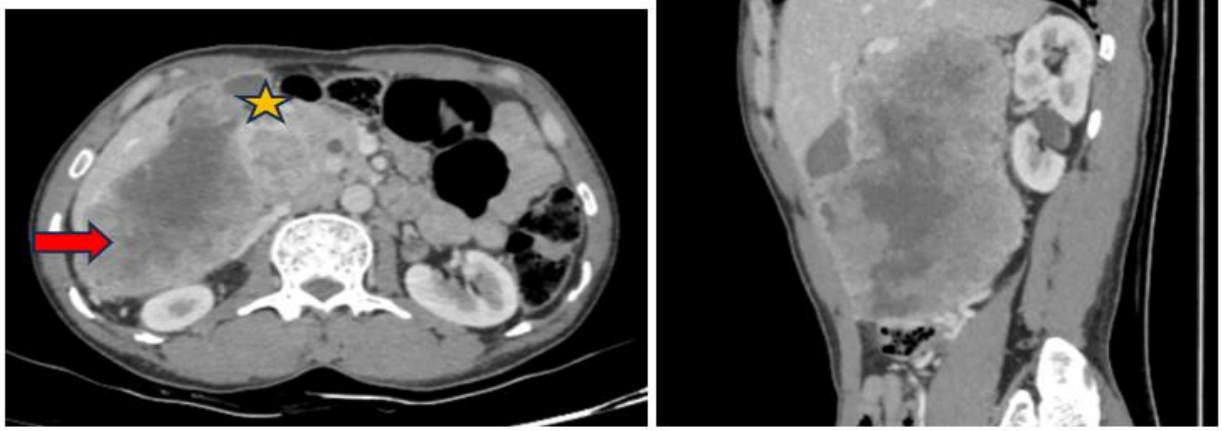
RESEARCH METHODOLOGY

Hospital based observational cross-sectional study was carried out among patients referred based on clinical indications to the department of radiodiagnosis at KLEs, Dr.Prabakar Kore hospital & MRC Belgaum for CT abdomen and pelvis contrast study for a duration of 12 months.
The study included 27 patients.
Each patient was subjected to plain and contrast enhanced CT to characterise the retroperitoneal tumour.
Scan was done using 128 slice GE Revolution EVO CT scanner.
The results were tabulated and evaluated descriptively by Microsoft excel 2021.

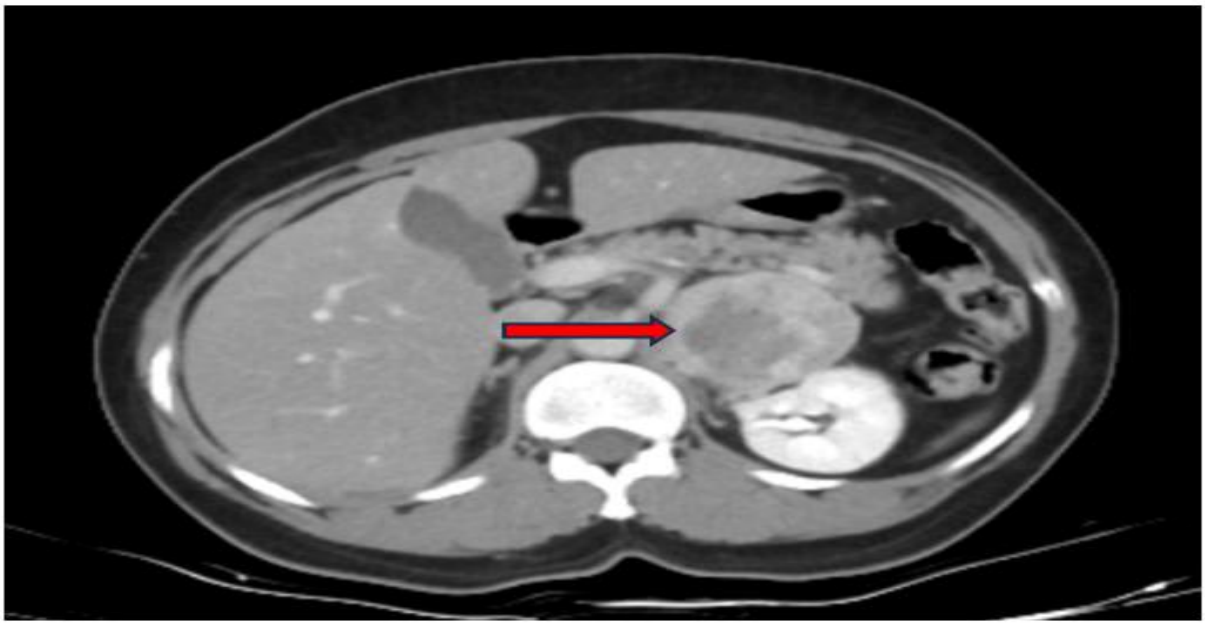
CASES



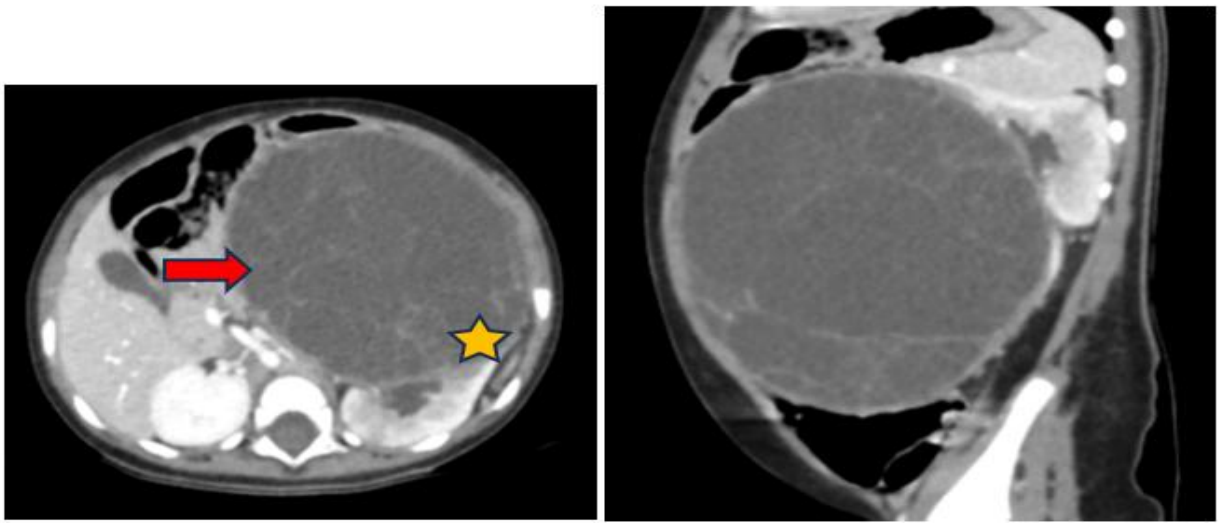
Well-defined multiseptated hypodense cystic area (yellow arrow) with enhancing solid components and internal calcifications (blue oval) in the pelvic retroperitoneum with abdominal extension & lateral displacement of adjacent bowel loops. It is a case of CYSTIC TERATOMA.



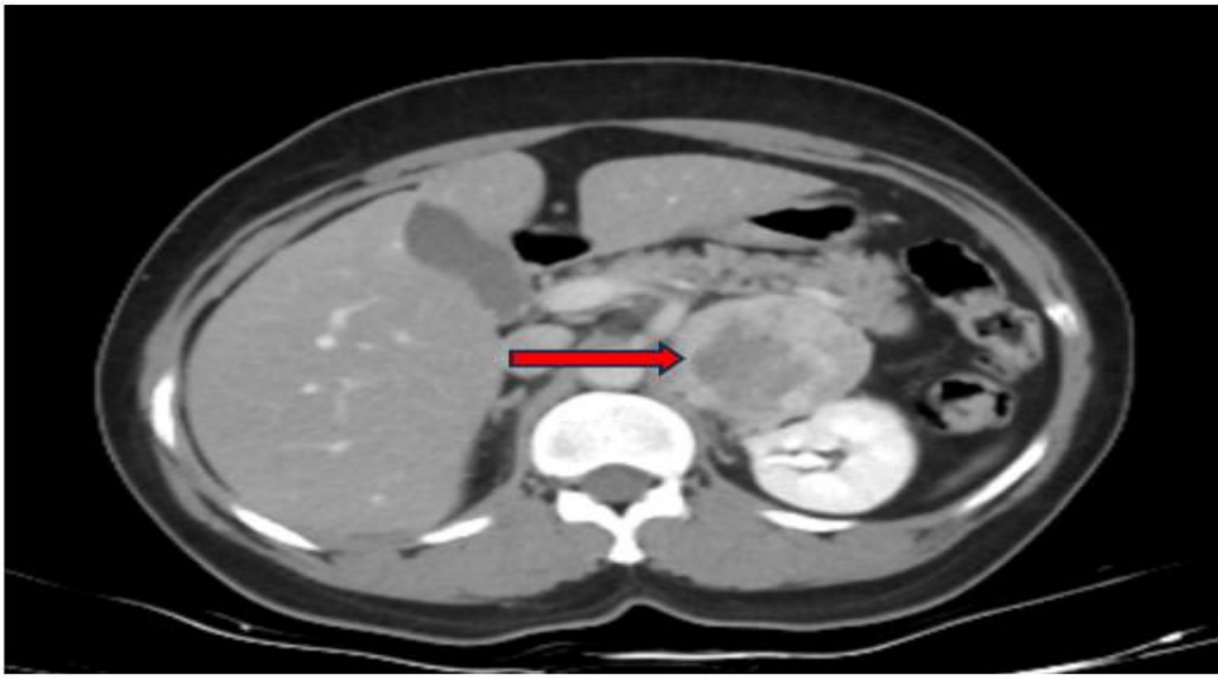
Heterogeneously enhancing solid lesion(➡) with central area of necrosis in the right anterior pararenal space with indistinct fat planes to head of pancreas & second part of duodenum(★). It is a case of DUODENAL GIST.



Well-defined predominantly arterially enhancing mass lesion(➡) with central necrotic areas noted in the left para-aortic & left anterior pararenal space. Its is a case of PARAGANGLINOMA



Peripherally enhancing predominantly cystic mass lesion(red arrow) with enhancing internal thin septations likely arising from the left kidney with positive claw sign (yellow star). It is a case of WILMS TUMOUR.



Well-defined hypodense cystic area (red arrow) with fat and soft tissue density area (HU -117) noted anterior to the left renal hilum. It is a case of DERMOID CYST

OBSERVATION AND RESULTS

Age group (in years)5	NO. OF PATINETS	PERCENTAGE (%)
0-10	4	14.8%
10-20	1	3.7%
20-30	1	3.7%
30-40	0	0

40-50	6	22.2%
50-60	5	16.6%
60-70	8	29.6%
70-80	2	7.4%
> 80	0	0

SEX	NO. OF PATINETS	PERCENTAGE (%)
MALE FEMALE	14 13	51.8% 48.1 %

Tumor distribution	Number of cases	Percentage(%)
Renal origin	4	14.8
Adrenal origin	2	7.4
Periampullary origin	1	3.7
Primary retroperitoneal tumors	20	74.0

Tumor characterization	Category	Number of cases	Percentage(%)
Size	<10 cm	23	85.1
	>10 cm	04	14.9
TUMOR COMPOSITION			
Nature of lesion	Solid	20	74.0
	Cystic	04	14.8
	Complex-Cystic	03	11.2
Fat	Present	01	3.7
	Absent	26	96.2
Calcification	Present	04	14.8
	Absent	23	85.1
Enhancement pattern	Noenhancement	06	22.2
	Homogeneous	09	33.3
	Heterogeneous	12	44.5

OBSERVATION AND RESULTS

Tumor characterization	Category	Number of cases	Percentage(%)
Necrosis in solid tumors	Present	09	33.3
	Absent	18	66.6
EFFECT ON ADJACENT STRUCTURES			

Displacement	Present	10	37.0
	Absent	17	63.0
Infiltration	Present	05	18.5
	Absent	22	81.4
Vascular encasement	Present	02	7.4
	Absent	25	92.6
Distant metastasis	Present	03	11.1
	Absent	24	88.8
Benign vs malignant	Benign	08	29.6
	Malignant	19	70.3

OBSERVATION AND RESULTS

RESULTS	CHAUDHARI ET AL	CURRENT STUDY
Total no. of cases studied	30	27
No. of male patients	17(56.6%)	14(51.8%)
No. of female patients	13(43.3%)	13(48.1%)
Youngest case	6 months	5 days
Oldest case	65 years	73 years
No. of benign cases	11(36.6%)	8(29.6%)
No. of malignant cases	19(63.3%)	19(70.3%)

INTREPRETATION

CT plays an important role in characterization of tumors, by determining location, origin, composition, enhancement pattern, effect on adjacent structure and distant metastases.

The characteristic imaging findings can help narrow down the differential diagnosis and therefore aids in treatment planning.

Malignant lesions were more common than the benign lesions. Similar findings were also seen in the studies conducted by Chaudhari A et al.

But the number of benign cases in Chaudhari et al., was more compared to our study.

Above study has concluded that CT has a major role in the diagnosis of retroperitoneal tumors.

DISCUSSION

Out of 27 patients, 17 (51.8%) were males and 13 (48.2%) were females.

Most commonly affected age group was 6th & 7th decade.

Histopathology confirmed the radiologic diagnosis in 23 cases.

A total of 70.3% of the lesions were malignant and 29.6% were benign.

Primary retroperitoneal tumors were the most common tumors (20 cases) accounting for 74.0% of cases.

Among primary retroperitoneal tumors; lymphnodal metastases was the most common tumor followed by lymphoma. Other tumors were cystic teratoma, dermoid, urinoma, ganglioneuroma, paraganglioma and lymphangioma.

Majority of the tumors were solid (20 cases) and seven were cystic. Heterogeneous enhancement was the most common pattern of enhancement which was seen

in 12 cases, followed by homogeneous enhancement seen in 9 cases.

The presence of necrosis most commonly found in the malignant tumors. In this study, 09 cases showed necrosis, out of which 07 were malignant & two cases were benign which included pheochromocytoma and paraganglioma.

Vascular encasement is also a feature of malignant tumor and determines the surgical respectability of the tumor.

In this study, two cases which showed vascular encasement were malignant tumors which included renal cell carcinoma and cystic teratoma.

Ureteric infiltration is seen in two cases which included cystic teratoma and lymphangioma.

CONCLUSION

Good knowledge of characteristic CT findings of benign & malignant conditions and their role in staging, therapeutic planning and follow-up in the setting of malignancy is essential for optimal patient care.

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