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The Role of Spiral CT-Scan in Assessment of Renal Cystic Lesions

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Abbreviation

ADPKD	Autosomal Dominant Polycystic Kidney Diseases
ARPKD	Autosomal Recessive Polycystic Kidney Diseases
B.K	Both Kidneys.
B.S	Both Side
CSRCs	Cortical Simple Renal Cysts
CT	Computed Tomography
L.K	Left Kidney
L.S	Left Side
MSRCs	Medullary Simple Renal Cysts
RCLs	Renal Cystic Lesions
R.K	Right Kidney
R.S	Right Side

Summary

Renal cystic lesions refers to any disorder that results from the presence of multiple renal cysts, for diagnosis used spiral CT, it have higher accuracy and efficiency in the diagnosis of renal cystic lesions. The total of number of patients was 50 (22 males &28 females) their mean age 50year. They have various renal cystic lesions, they are collected from the specialized surgical hospital. CT examination was the initial investigation in all cases and then biopsy examination, all patient were injected with contrast media but appear with non-enhancement scan. The patients are divided into after investigation six groups according to the type of the disease as fallow:

1.Cortical simple renal cyst with 18 patients (36%).

2. Medullary simple renal cyst with 11 patients (22%).

3. Autosomal recessive polycystic kidney disease with 3 patients (6%).

4. Autosomal dominant polycystic kidney disease with 5 patients (10%).

5. parapelvic cysts with 8 patients (16%).

6. perinephric cysts with 5 patients (10%).

استخدام المفراس الحلزوني في تشخيص الأمراض الكيسية التي تصيب الجهاز البولي

الخلاصة

إن أمراض الجهاز البولي الكيسية هي التي تسبب الاضطرابات في الجهاز البولي نتيجة لوجود اكياس متعددة فيه ولغرض التشخيص استعمل المفراس الحلزوني لأنه يمتلك دقة وكفاءة عالية في تشخيص الأمراض الكيسية التي تصيب الجهاز البولي.

تم فحص 50 مريضاً (22 من الذكور و 28 من الإناث) متوسط عمرهم 50سنة مصابين بمختلف أمراض الجهاز البولي الكيسية، جمعت هذه العينات من وحدة المفراس في مستشفى الجراحات التخصصية. كان فحص المفراس ه و أول فحص يقوم به جميع المرضى ومن ثم اجراء الفحص المختبر، جميع المرضى حقنوا بمادة ملونة لكنها لم تظهر أي تحسن في عملية التشخيص أظهر الفحص أن المرضى على ستة مجاميع حسب نوع المرض كالاتي:

1. مجموعة الأشخاص المصابين بالإمراض الكيسية البسيطة التي تصيب قشرة الكلى وعددهم 18مريضاً (36%).
2. مجموعة الأشخاص المصابين بالأمراض الكيسية البسيطة التي توجد في لب الكلى وعددهم 11مريضاً (22%).

3. مجموعة الاشخاص المصابين بالأكياس نتيجة العمليات الوراثية من النوع المتنحي (النادر) وهم 3 مرضى (6%).
4. النوع المتغلب (السائد) فهم 5 مرضى (10%).
5. مجموعة المصابين بالأكياس حول الحوض الكلوي وهم 8 مرضى (16%).
6. مجموعة المصابين بالأكياس التي توجد حول الكلى وهم 5 مرضى (10%).

Introduction

Spiral CT-scan is a special type of x-ray procedures that involves the indirect measurement of the attenuation of x-ray at numerous positions located around the patient being investigated, the radiography obtained with moving source image receptor assembly [1]. It provides valuable information about wide spectrum of renal disorders, it is highly accurate for determining the nature and extend of renal mass and play valuable role in assessing patients with renal cystic disease [2]. In some investigation used contrast media which has different density to x-rays than that of the body, the density increased by the contrast media thus the signal intensified [3].

Renal cystic lesions (RCls) refer to any disorders that result from the presence of multiple renal cysts, they are frequent incidental findings in adult and may be located at any where in the parenchyma, they are exophytic or parapelvic [2]. Renal cystic lesions include:

- Cortical simple renal cysts (CSRCs). They are discovered incidentally at autopsy or on imaging studies, their frequency increase with age[4]
- Medullary simple renal cysts (MSRCS): the classic features are elongated papillary tubules or cavities, large kidney with modularly calcification [5]
- Parapelvic cysts: These are though to be lymphatic in origin they can be solitary or multiple and causes loin pain, hematuria and obstruction [6].
- Perinephric cysts: They are either sub capsular or lie within perinephric fat and sequal to truma or obstruction [5].
- Polycystis disease: It is hereditary disease, as these cysts grow, they enlarge the kidney but do not necessarily distort the shape until the disease process has

reached an advanced stage. This disease process occurs bilaterally and the most common clinical symptoms include hematuria, polyuria and hypertension and polycystic disease are classified into two types: Autosomal recessive polycystic kidney disease and Autosomal dominant polycystic kidney diseases [7]

- Autosomal recessive polycystic kidney disease (ARPKD): it is characterized actasia of the renal collecting tubules and ducts [8].

- Autosomal dominant polycystic kidney diseases (ADPKD): It is the most common genetic disease, most cases are due to an abnormal gene [9]

The Aim of the study:

1. To assess the role of spiral CT – scan in diagnosis of renal cystic lesions.
2. To measure the efficiency of spiral CT – scan with other investigation efficiency in assessment of the renal cysts and management of these cases.

Patients and Method

All patients included in this study were having various renal cystic lesions, they were diagnosed at specialized surgical hospital from December 2003 to April 2004.

A total number of 50 patients (22 males and 28 females) the range of age between (20-70) years and their mean age was 50 years. Their cases notes and radiological investigation were reviewed. CT examination was the initial diagnostic study in all cases also the biopsy. Contrast injection was performed to all the patients in this study and Contrast media examination appear with non – contrast enhancement with various types of renal cystic lesions because they are vascular disease or masses.

Patient is placed supine in CT scan, table which is moved during the scanning, the abnormal region (for kidney) should be examined without movement to reduce the artifacts.

Examination includes:

- Axial view.
- Coronal section and post contrast view which include axial and coronal section to demonstrate active lesions and sagittal section if needed. We take the biopsy is the most sensitive and widely used for confirming and exclude the suspection of malignant diseases which are associated with some renal cystic lesions in urinary tract.

Results

Table (1) Age distribution of patients with renal cystic lesion. In comparison to sex of the patients.

number. of pts. / Age	Total No. of patients		Male		Female	
	Pt.	%	Pt.	%	Pt.	%
20-29	6	12	2	33	4	67
30-39	8	16	1	13	7	87
40-49	10	20	4	40	6	60
50-59	15	30	9	60	6	40
60-70	11	22	6	55	5	45
Total	50	100	22	44	28	56

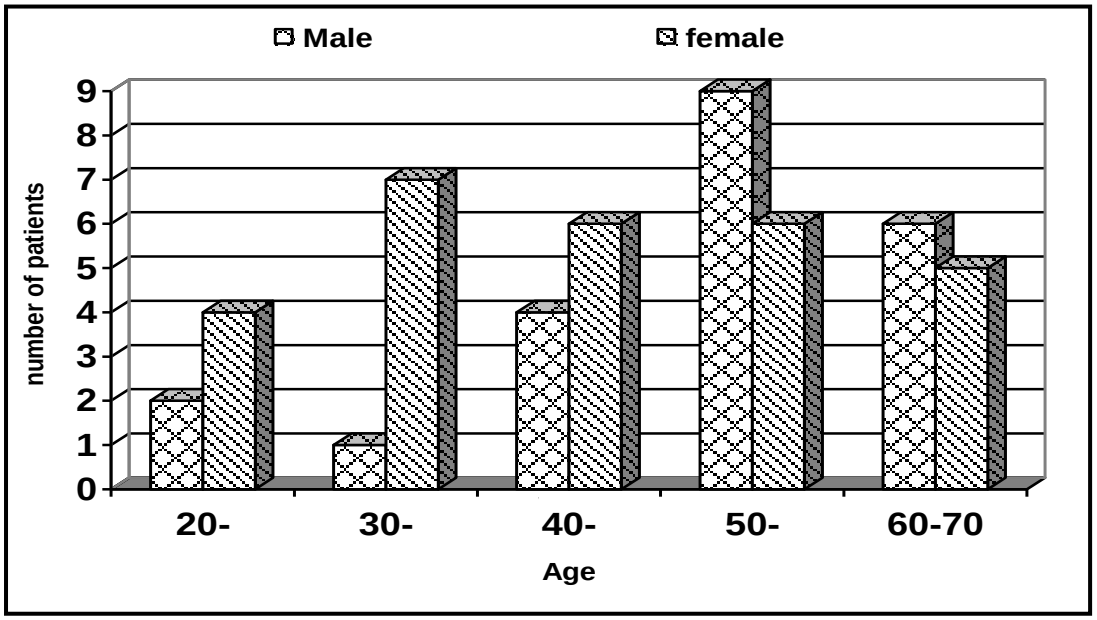

Fig. (1): Shown age distribution of patients. In comparison to sex

Table (2): The relation between Age & Duration of disease with sex of patient

number of patients . / Age	Male (22)	Female (28)	Total (50)
Age (range)	20-70yr	22-60 yr	20-70 yr
Age (mean)	50yr	38 yr	44 yr
Duration of disease (range)	3-8 yr	2-6 yr	2-8 yr
Duration of disease (mean)	4.6 yr	2.6 yr	3.6 yr

Table (3): Distribution of patients gender according to type of renal cystic lesions.

Patient's number. / Type of disease	Total No. of patients		Male		Female	
	Patient	%	Patient	%	Patient	%
CSRC	18	36	9	50	9	50
MSRC	11	22	4	36.4	7	63.6
ARPKD	3	6	2	67	1	33
ADPKD	5	10	2	40	3	60
Para pelvic Cyst .	8	16	3	37.5	5	62.5
Perinephric Cyst.	5	10	2	40	3	60

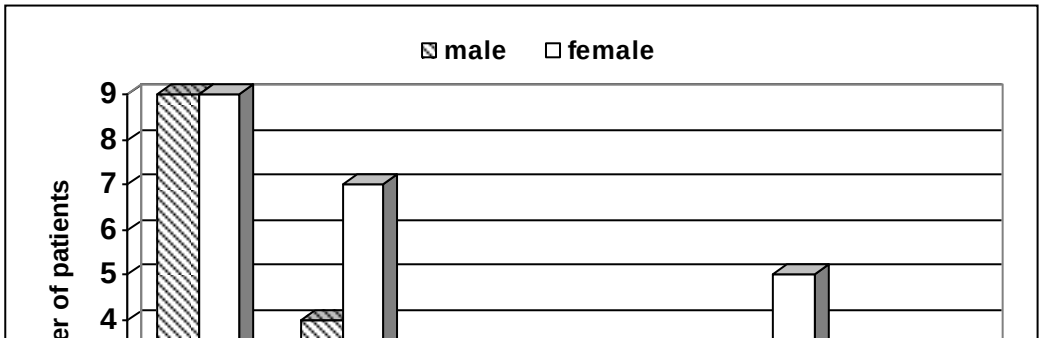

Fig. (2): Shows Distribution of patients gender with type of renal cystic lesions .

Table (4): site of cysts is relation to total number of patients

Site of cyst	Number. of patients	Percentage
Left kidney	10	20%
Right kidney	11	22%
Both kidneys	16	32%
Left side of pelvis	7	14%
Right side of pelvis	5	10%
Both sides of pelvis	1	2%
Total	50	100 %

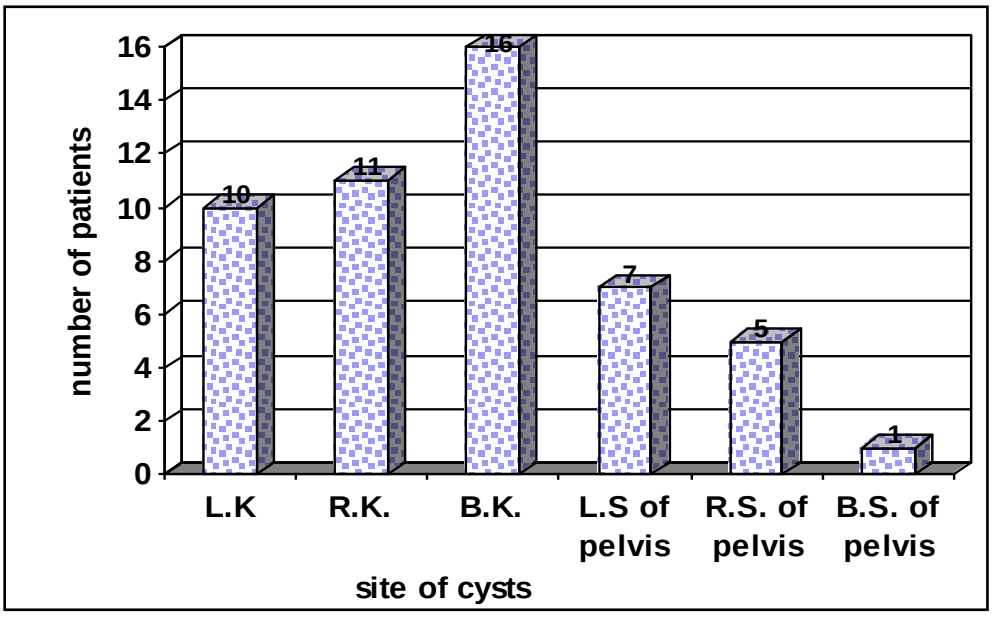

Fig. (3): Site of cysts is relation to total number of cases

Table (5): the relation between the patient and sign and symptoms

Sign and Symptoms clinical presentation	number of Patients	Percentage
Flank Pain	36	72%
Urinary tract infection	16	32%
Hematuria	15	30%
Dilated pelvi – caliceal system	10	20%
Shrinkage cortex and medulla	4	8%
Hydronephrosis	6	12%
Asymptomatic	15	30%

Table (6): site of cyst distribution is relation to the type of renal cystic lesions

Site of disease / Type of cysts		Left kidney	Right kidney	Both kidneys	Left side of pelvis	Right side of pelvis	Both side of pelvis
$CSRC_S$		6	8	4	-	-	-
$MSRC_S$		2	2	7	-	-	-
polycystic kidney disease	ARPKD	-	1	2	-	-	-
	ADPKD	2	-	3	-	-	-
Para pelvic cysts		-	-	-	5	2	1
perinephric cysts		-	-	-	2	3	-
Total		10	11	16	7	5	1

Table (7): The relation between the size of cysts and total number of patients with percentage of cases

Size of cysts (cm)	Number of patients	Percentage
< 1	3	6%
1-	7	14%
3-	18	36%
6-9	11	22%

> 9	5	10%
confluent	6	12%

Table (8): CT-scan and Biopsy finding comparison

Findings / Age	CT Finding		Biopsy Finding	
	Number. of patients	%	Number. of patients	%
20-29	6	12	6	12
30-39	8	16	8	16
40-49	10	20	10	20
50-59	15	30	15	30
60-70	11	22	11	22
Total	50	100	50	100

Discussion

The diagnosis of renal cystic lesions are made on the basis of typical radiological finding with normal renal function.

1. **Age Distribution**: The fifty patient were studied, their age ranging from 20 – 70 years, mean age 50 years, we found most patients with various renal cystic lesions were in the age between 50 – 59 years were 15 patients (30%) of total number of patients Table (1). We note the probability of presence more cases with renal cystic lesions increased in older patient than young the population over 50 years of age have renal cystic lesions, these are usually the result of renal vascular disease and are considered retention cysts [10] This result is adequate to the study of [11]
2. **Gender Distribution**: The total numbers of patients 50 cases, 22 patients (44%) were males and 28 patients (56%) were females, so the females were more affected than the males. This result is agreement with [12]

3. **Duration of Disease**: In the present study from Table (2) we seen that duration of renal cystic lesions in male is 3 – 8 years and shorter duration of disease in female is 2 – 6 years, this result is in agreement with [5]
4. **Site of Cyst**: 32% of our patients have delineated cysts involving the both medullary and cortex in both kidneys in all types of cysts that mean both kidneys are commonest site of Cysts. 22% of our patients involves right kidney. 20% involve left kidney and 14% involve left renal pelvis, 10% of patient involve right side of pelvis while 2% involve with both renal pelvis Table (4), that is agree to the study done by [5].
5. **CT-Scan Finding**: CT plays very important role in a diagnosis of renal cystic lesions. Fifty patients which showed positive finding of renal cystic lesions 100% when investigated by CT – scan, this result was compared with biopsy finding and we obtained the results in CT finding were adequate the result of the biopsy, so the CT- scan has high efficiency in diagnosis of renal cystic lesions.

Conclusions

1. Spiral CT-scan has high efficiency and accuracy 100% in diagnosis of renal cystic lesions.
2. Axial section with and without contrast media seems to be better than coronal images or other images in delineating the cysts.
3. There was no relation between site of cysts and age of patients.
4. The commonest site for renal cysts was both kidneys.

Recommendation

1. In case of no contra-indications for spiral CT-scan it is recommended as method of choice for investigation every patient with feature of renal cystic lesions.
2. In spiral CT-scan views should include axial and coronal views (with and without contrast media) to be useful for delineated the lesions.

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