PRESENTATION AND EVALUATION OF RENAL MASSES

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ABSTRACT

Objective: To find out the various disorders presenting as renal mass to a referral centre for Urology over a 2 year period.

Design: A descriptive study.

Place and Duration of Study: The study was conducted at Armed Forces Institute of Urology Rawalpindi and Combined Military Hospital, Kharian Pakistan from March 2002 through March 2004.

Patients and Methods: A total number of 43 patients who presented as a renal mass or found to have renal mass during the course of investigations and subsequently underwent treatment at the institute were analyzed in the study. Their mode of presentation as various age group distribution and workup, histological break-up, treatment offered and follow-up was recorded

Results: A total number of 43 patients presented as renal mass during the period of study. Seventy four percent of the masses turned out to be renal cell carcinoma and radical nephrectomy was the most common procedure performed (34 patients). Hematuria was the most common mode of presentation as seen in 32 (74%) patients followed by lumbar pain in 30 (70%) patients. Majority of the lesions was in 46-55 year age group with 33 (77%).

Conclusion: Advances in diagnostic modalities such as CT and MRI will continue to expand the role of preoperative imaging for the diagnosis of renal masses. Surgery remains the mainstay of treatment for the majority of such masses and with increasing detection at an early stage, may possibly improve the cure rate of renal malignancies as well.

Keywords: Renal mass, investigations [etiology], renal cell carcinoma

INTRODUCTION

Evaluation of renal masses has undergone a significant change. Conventional imaging techniques such as intra venous uroglam (IVU) and ultrasonography have been augmented with CT scan and MRI. As more patients are being imaged, the incidental detection of renal masses has also increased, uncovering neoplastic disease which may require surgery. The ability to characterize these lesions accurately, to determine their management and to stage malignancies can now been afforded. This study was conducted to determine the frequency of various disorders presenting as renal mass during a 2 year period.

PATIENTS AND METHODS

A descriptive study was conduced with retrospective data at the Armed Forces Institute of Urology, Rawalpindi and Combined Military Hospital, Kharian Pakistan from March 2002 through March 2004. All patients were subjected to routine baseline investigations including complete blood count, urine routine exam, urea creatinine and electrolytes, blood glucose (fasting) and ultrasound of kidney ureter bladder (KUB) area. Cystoscopy was routinely done for all patients presenting with

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hematuria. CT scan and MRI was done for all cases of suspected neoplasia for staging and involvement of the venous system. Every patient underwent excretory urography with X-ray KUB area. Diagnostic study of most patients was followed by ultrasonography to determine whether the mass noted was solid or cystic.

Patients were prepared for surgery with appropriate counseling and arrangement of blood after grouping and cross match. The choice of loin or transperitoneal approach was based on the surgeon's preference and location of tumour; however the majority of masses were managed by the traditional 12th rib and the subcostal approach for all cases of RCC, renal adenoma, lymphoma, infections and the case of tuberous sclerosis while all cases of transitional cell carcinoma were managed by the trans-peritoneal route. Principle of early ligation of the artery followed by vein for neoplastic masses with subsequent removal of the kidney with Gerota's fascia has been followed.

Inclusion Criteria:

All patients with symptomatic renal masses or those lesions that were detected incidentally either on ultrasonography or for other reasons where the patients were referred from other departments for the incidental finding of a renal mass was included in the study.

Exclusion Criteria:

All cases of obstructive calculus uropathy leading to gross hydronephrosis were excluded so also were cases of angiomyolipomas as suggested on scanning less than 3 cm in size.

All lesions were sent for histopathology. Adequate follow-up data was available for 30 patients despite the fact that all patients were entitled to free treatment. 3 cases with benign lesions and 7 cases of malignancy were subsequently lost to follow up. All cases were administered Injection Cefoperazone for 5 days postoperatively. Bone scan and Chest radiography was done for malignant masses who had symptoms postoperatively at 3 weeks. Data analysis was afforded by the physical check of record of the patients kept in the institute and all variables were analyzed retrospectively.

DATA ANALYSIS

Data had been entered and analyzed using SPSS version 10.0. Descriptive statistics i.e. mean $\pm$ SD for numeric variables and frequency alongwith percentages for categorical variables were used to describe the data.

RESULTS

Forty Three renal masses were encountered during the course of the 2-year period under study. The age of the patients varied from 25 to 79 years with the mean age being 51 years. 33 (77%) of the patients were male and majority of the patients was in the 46-55 year age group (table-1) male : female ratio being 3:1 (figure). Renal cell carcinoma (RCC) was seen in 32 (74%) patients whilst transitional cell carcinoma (TCC) was present in 4 (9%) patients. Chronic xanthogranuloma--tous pyelonephritis was also seen in 4 (9%) patients, while one (2%) case each of renal adenoma, lymphoma and tuberous sclerosis was encountered (table-3).

The most common presenting feature was hematuria, seen in 32 (74%) patients followed by lumbar pain in 30 (70%) patients. Fever not responding to outdoor treatment and weight loss was seen in 26% of cases (table-2). Hypertension was seen in 20% where the diastolic pressure was greater than 90 mm Hg. Diabetes Mellitus was seen in 15 (35%) patients. Around 60% of the patients were smokers. Radical nephrectomy was done in 34 (79%) patients, out of which 3 cases required clamping of IVC and its subsequent opening to remove tumour extension. Radical nephroureterectomy was done in 5 (12%) patients, all those with

Transitional Cell Carcinoma (TCC) including one patient with renal adenoma as on investigations including excretory urography and CT it was found projecting into the renal pelvis simulating a TCC while the patient had intractable hematuria. Salvage nephrectomy was required in 4 (9%) patients, 3 had severe hematuria and one had intractable pain. One case of right salvage nephrectomy required clamping of the right renal artery between the abdominal aorta and the IVC as the renal pedicle could not be clamped due to tumourous lymph nodes at the site. The most common finding was a mass with distortion and displacement of the collecting system but calcification was seen in the scout films in 3% of cases and non visualization of the kidney in 10%. Fifteen (35%) of the masses involved the upper lobe, 21 (49%) the lower pole and 7 (16 %) involved either the whole kidney or the renal pelvis.

Asymptomatic masses were encountered in 5 (12%) patients (12 % of cases) who were sent to the urology OPD upon being incidentally found during the course of investigations for other abdominal complaints.

Table-1: Age distinguish of patients.

Age Distribution	N	%
25-35	4	9
36-45	7	16
46-55	16	37
56-65	12	28
66-75	3	7
76-85	1	2

Table-2: Presenting complaints.

Symptom	N	%
Lumbar pain	30	70
Hematuria	32	74
Incidental	5	12
Pain	5	12
Mass	3	7
Fever	11	26
Metastasis	6	14
Weight loss	11	26
Triad of symptoms*	3	7

**Hematuria, Mass and Loin pain*

Table-3: Histological break-up.

Pathology	n
Renal Cell Carcinoma	32
Transitional Cell Carcinoma	4
Renal Adenoma	1
Lymphoma	1
Chronic Xanthogranulomatous Pyelonephritis	4
Tuberous Sclerosis	1

DISCUSSION

The ever increasing use of ultrasound, CT and MRI explains the increasing incidence of

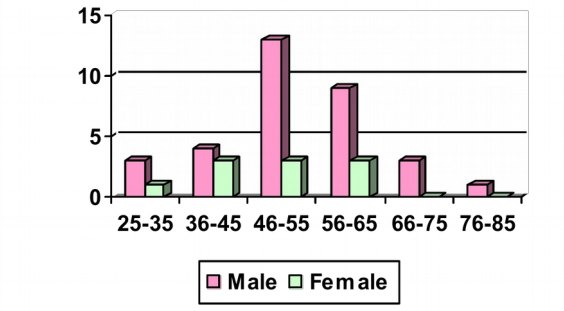

Figure: Age and gender distribution.

RCC with an increasing presentation of localized RCC [1]. When a renal mass lesion is encountered; the challenge is to distinguish solid renal masses from the more common benign renal cysts. Few purely cystic lesions prove to harbour cancer, but the fear of cystic renal cancer has caused greater diagnostic difficulties. The diagnosis of early renal lesions and cystic tumors is an increasing dilemma ever since the advent of better imaging procedures.

The classical triad of loin pain, hematuria with a palpable mass presents only in 10% of RCC though these symptoms may occur individually in up to 40% of cases [1]. Our findings of hematuria as the most common initial symptom support those of other investigators [2]. The classic triad noted in 7% of our study is apparently not so classic and is usually a sign of late disease [3]. Any renal mass that enhances with IV contrast should be considered a RCC until proven otherwise. The prognosis of RCC is related to tumor stage. CT and MRI are accurate in the staging of RCC and are the examinations of choice in preoperative assessment [4]. Smelka et al demonstrated that MRI was more accurate than CT for the evaluation of tumour extension into the renal vein and inferior vena cava; this being important in that the surgical approach will be altered if the thrombus extends more proximally [5]. Patients with RCC may have enlarged hyperplastic

retroperitoneal lymph nodes, a known pitfall in the staging of RCC [6].

The discovery of small renal lesions will not ensure that mortality from cancer will be reduced. The chance finding that of small renal lesions might simply reflect the detection of early cancers that will be lethal in any case (lead-time bias), the detection of cancers that are growing slowly and are less likely to be lethal (length-time bias), or the detection of tumors with questionable malignant potential (over diagnosis bias) [7].

Diabetes Mellitus and hyperlipedemia are common in patients with RCC. In one series 14% of the patients also suffered from Diabetes Mellitus at a frequency 5 times that found in the general population [8], compared to a much higher number of patients encountered in our study at 35% .Further studies are needed to explain this association.

A risk factor for RCC may be cigarette smoking, which may explain the greater frequency of this disease among male subjects. However, in a retrospective study of smokers in the US with RCC by Bennington and Laubscher the greatest increase in risk was among those men smoking pipes and/or cigars [9].

An interesting comparison on clinical presentation is by a study of Amanullah and colleagues of Mayo Hospital Lahore, Pakistan; they studied 25 patients with RCC and noted a mass in 48%, Lumbar pain in 48% and the classical triad of pain, mass and hematuria in 4% [10]; whilst in our study these were noted in 7%, 70% and 7% respectively. Incidental detection was seen in 28% of cases in their study while we had a similar presentation in only 12% of cases. At follow up, all cases of benign lesions (3 lost to follow up)are alive and healthy and 7 patients including one case of TCC and 6 cases of RCC failed to report further however all patients with metastasis have died and a further 2 have developed opacities in the lungs. Renal vein involvement was present in 21% of patients stressing the need for a preoperative road map. Our data support the aggressive surgical management of patients with RCC with tumor in the renal vein. In our series therapy with irradiation or chemotherapy was used in 6 patients with advanced metastatic disease without much success. Preoperative or postoperative irradiation has not been shown definitely to enhance survival and is no longer used routinely.

Non-surgical lesions presenting as renal masses include Angiomyolipomas also known as renal hamartoma, they may be associated with tuberous sclerosis (20%), in which case they tend to be multiple and bilateral [11]; this is the only renal tumor that can be characterized based on its tissue composition on demonstrating macroscopic fat within the lesion [12]. Recent case reports have demonstrated that if a renal mass contains calcification in addition to fat, the possibility of RCC must be seriously considered [13].

Lymphoma may involve the kidneys via hematogenous spread, in which a single mass or multiple bilateral masses are present, or by direct extension of a retroperitoneal lesion. In patients with known lymphoma and in whom where there is a single focal mass in the kidney that could represent lymphoma or a coexistent RCC, treatment of the lymphoma is indicated. If the lymphoma responds to treatment but the renal mass does not, RCC is the likely diagnosis. The most common tumor to metastasize to the kidney is carcinoma of the lung. In a patient with a history of malignancy (without other metastasis) and a solitary renal mass, the renal mass is more likely to represent a RCC and not a metastasis. A renal biopsy is indicated to determine proper management [14].

Occasionally, a benign condition may present as a renal mass and it may be difficult to differentiate from a renal neoplasm. This group of lesions includes congenital anomalies, inflammatory masses, hematoma, hydrocalyx, and vascular structures.

Renal pseudotumors refer to normal renal tissue that may mimic a renal neoplasm, which may be congenital or acquired in nature. Congenital variants include prominent columns of Bertin, renal dysmorphism, andomedary humps, may all be mistaken for a renal tumour. The key in the proper diagnosis of these pseudo tumors is to demonstrate that the lesion enhances identically to the renal parenchyma.

Pyelonephritis and renal abscesses may be mistaken for a renal neoplasm on imaging studies however, when placed in the proper clinical context; the correct diagnosis usually becomes evident. Nevertheless, differentiating cystic renal neoplasms from a subacute or chronic renal abscess when the typical clinical findings of infection are not present can be difficult. This situation is one in which the needle aspiration of a cystic mass is justified. If pus is recovered, percutaneous drainage can be performed. If blood or necrotic debris is recovered, surgical removal is indicated.

A renal artery aneurysm or an arteriovenous fistula may present as an enhancing renal mass.CT or MRI exam performed with contrast will delineate the vascular nature of such lesions.

CONCLUSION

Renal mass is a common urological finding and with a history of hematuria, lumbar pain and mass abdomen, a through investigation is mandatory. Advances in diagnostic modalities such as CT and MRI will continue to expand the role of preoperative imaging for the diagnosis of renal masses. Surgery remains the mainstay of treatment for the majority of such masses and with increasing detection at an early stage, may possibly improve the cure rate of patients with malignancies of the renal tract as well.

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