* RESULTS

All cases were examined using the intravenous digital subtraction angiography technique. It provides adequate visualisation of the number and location of the renal arteries in all of the 30 cases. However, 7 cases were exposed to the selective intra arterial digital subtraction angiography technique for further evaluation by better visualisation of the intrarenal vasculature.

The final diagnosis of the 30 cases of renal masses is shown in table 1.

Table (1): Final diagnosis of our 30 cases :-

Type of mass	No. of correct diagnosis	No. of mis-diagnosis
Malignant tumours	23	2*
Renal cysts	2	—
Renal abscess	2	—
Pseudo tumour	1	—
Total	28	2

* One case misdiagnosed as malignant vascular mass was hamartoma (angiomyolipoma).

The other case misdiagnosed as hypovascular mass was perinephric abscess.

The final diagnosis in our cases was confirmed by histopathological examination in 27 cases, ultrasound guided percutaneous puncture of renal absecss in one cases and in the remaining two cases (renal cysts) by the data obtained from the other radiological techniques including ultrasound-guided cyst puncture and cytological examination of the aspirate in one of them .

The final results of the correctly diagnosed malignant renal tumours are given in table (2) :

Type of tumour	No. of cases
Renal cell carcinoma	20
Wilms' tumour	2
Renal pelvic tumour	1

Age and Sex Distribution :

The age and sex distribution in our cases is shown in table (3)

Table (3) Age and sex distribution in 30 case of renal mass

Type of mass	No. of cases	Age in years	Sex	
			Male	Female
Renal cell carcinoma	6	31 - 40	5	1
(20 cases)	8	41 - 50	5	3
	4	51 - 60	3	1
	2	61 - 70	1	1
Wilms" tumour	2	4 & 6	2	___
Renal pelvic tumour	1	55	1	___
Renal cysts	2	43 & 45	1	1
Benign tumour (Hamartoma)	1	45	___	1
Pseudo-tumour (Lipofibromatosis)	1	58	___	1
Renal abscess	2	22 & 38	1	1
Perinephric abscess	1	28	1	___
Total	30	4 - 70	20	10

Calcification within the renal mass was seen in 4 cases, 3 were hypernephroma and the other case was renal cyst.

Ultrasonographic findings in our 30 cases are shown in table (4)

Table (4) : Ultrasonic features in 30 renal masses:-

Final diagnosis	No. of cases	Ultrasonic appearance		
		solid	cystic	complex
Renal cell carcinoma	20	15	___	5
Wilms' tumour	2	2	___	___
Renal pelvic tumour	1	1	___	___
Renal cysts	2	___	2	___
Hamartoma	1	1	___	___
Lipofibromatosis	1	1	___	___
Renal abscess	2	___	___	___
Perinephric abscess	1	___	___	1
Total	30	20	2	6

Among the 20 correctly diagnosed as malignant tumours and proved to be renal carcinoma 14 were hypervascular while 6 were hypovascular tumours. Digital subtraction angiographic findings of these cases are shown in table (5) .

Table (5) : Angiographic findings in renal cell carcinoma (20 cases):-

Angiographic findings	No. of cases
Increased vascularity	14
Random distribution of vessels	14
Tortuous vessels	13
dilated vessels	11
pooling of contrast	14
Arteriovenous communication	12
Encasement of arteries	10
Neoplastic response to epinephrine	4
Renal vein invasion	2
Displacement of renal artery & its branches	20
Non homogeneous nephrogram	17
Enlarged renal artery	16

The tumours were classified into hypervascular tumours (Fig 5,C) in the presence of neovascularity and hypovascular tumour (Fig 7,C) in the absence of neovascularity.

Intraarterial digital subtraction angiography technique was carried out in the 6 cases with hypovascular tumours with intraarterial injection of 5 u gm epinephrine . 4 cases showed response to epinephrine in the form of pooling of contrast medium and appearance of pathological vessels (Fig 7,D).

One case was misdiagnosed as hypervascular tumour because it showed tortuous vessels, large feeder artery and multiple aneurysms (Fig 8,C) .Its histopathological diagnosis angiomyolipoma (hamartoma).

The other case, misdiagnosed as hypovascular tumour, appeared on ultrasound examination as complex mass mainly solid hypoechogenic at the anterolateral portion of the lower pole and mid-zone. The operative findings revealed that it was perinephric abscess (Fig 9,C).

Two cases diagnosed as Wilms' tumour showed stretched, narrowed, displaced and amputated vessels. Encasement of vessels and presence of tumour vessels were also identified (Fig 10,C).

One case of renal mass showed irregular filling defect at the renal pelvis on I.V.U. and retrograde pyelogram & solid echo pattern on ultra sound . On DSA it appeared as hypovascular space occupying lesion, so it was diagnosed as renal pelvic tumour (Fig 11,D).

Two cases of the renal cysts appeared as hypovascular space occupying lesion, hypodense in nephrogram and showing thin wall and displaced & stretched arteries. One of them showed clacification and so was subjected to intraarterial DSA (Fig 12,E).

Two cases of renal abscess showed illdefinition and localised buge of the renal outline, stretched and displaced vessels with diminished side branches and mottled density in nephrogram. One of the two cases showed mild neovascularity and the other showed prominent capsular vessel (Fig 13,C).

One case showed a central well defined space occupying lesion on I.V.U. in the form of stretched and elongated major calyses & impressed minor calyces from the sinus side . It appeared solid echo-dense on ultrasound. On DSA it appeared as well-circumscribed hypo-vascular lesion, at the region of the renal hilum, hypodense in nephrogram, so it is diagnosed as lipofibromatosis of the renal sinus (Fig 14,C). Two cases showed infilteration of the renal vein in the form of malignant thrombus appearing as hypervascularity at the region of the renal vein (Fig 15).

Fig. (5) : Hypervascular Rt. renal tumour.

(A) I.V.U. Showing space occupying lesion at the middle and lower aspects of the Rt. kidney with amputated middle and lower calyces.

(B) Ultrasonography of the same case showing a large Rt. renal mass of heterogeneous echogenicity, mainly solid with evidences of areas of systic degeneration.

(C) IV-DSA of the same case showing increased vascularity, random distribution of vessels, dilated tortuous vessels, pooling of contrast and displacement of the renal artery and its branches.

Fig. (6): Hypervascular Rt. renal tumour

(A) U.T.P. & I.V.U. showing a clacified space occupying lesion at the lateral aspect of the Rt. kidney with distorsion and medial displacement of the pelvicalyceal system.

(B) CT scan of the same case showing evidences of large mass lesion (14-5 X 15 X 18cm) of heterogeneous attenuation pattern with irregular central areas of low attenuation due to breaking down & dense spotty califications.

(C) Ultrasonogram of the same case showing a large Rt. renal mass of complex echogenicity, mainly solid with evidences of califications.

(D) IV-DSA of the same case showing dilatation and upwerd displasment of the main renal arteries, stretchement and medial displacement of the intra-renal vessels, dilatation and random distribution of the tumour vessels.

Fig (7) : Hypovascular renal tumour with IA-DSA.
(A) Evidences of Lt. Upper polar space occupying lesion on I.V.U.

(B) Hypo-echogenic mass with many cystic areas at the Lt. upper pole on ultrasound.

(C) IV-DSA (Vascular and nephrolographic phases) showing evidences of hypo-vascular occupying lesion .

(D) IA-DSA of the same case showing no evidences of pathological vasculature before adrenaline injection.

A localised pooling of contrast is seen as a response to epinephrine.

Fig (8) : Angiomyolipoma
(A) I.V.U. showing space occupying lesion at the upper pole of Rt. kidney with amputated upper calyx and distortion and deformity of the adjacent calyces.

(b) Ultrasonography of the same case showing large cenrtal echo-dense mass with calcification.

(C) IV-DSA of the same case showing pathological circulation, abnormal vessels, stretchement and displacment of the intrarenal vessels.

N.B. : This case misdiagnosed as hypervascular renal tumour.

Fig (9) : Chronic perinephric abscess
(A) Incomplet filling and stretchment of the lower and middel calyces of the Rt. kidney on I.V.U.

(B) A hypo-echoic mass at the anterior portion of the lower pole and extending anteriorly and upwards beyond renal contour on ultrasound.

(C) IV.DSA of the same case showing a hypo-vascular space occuping lesion at the lateral part of the lower pole of Rt. kidney.

N.B. It was mis-diagnosed as hypo-vascular renal tumour.

FIG (10) : Wilms tumour.
(A) I.V.U showing space occuping lesion pushing the Rt. kiney medially, the calyces are distored and stretched.

(B) Ultrasonography of the same case°showing a large Rt. renal mass of complex echogenicity, mainly solid with few areas of cystic degeneration.

(C) IV-DSA of the same case showing increased vascularity, stretchement and displacement of intrarenal vessels.

FIG (11) : Renal pelvic tumour
(A) Nephrotomography of the Lt. kidney showeed marked hydronephrosis with non visualisation of the Lt. ureter.

(b) Retrograde pyelography of the same case showing a filling defect in the renal pelvis extending to the upper calyx and the proximal part of the ureter.

(C) Ultrasonography of the same case showing solid hyperechogenic mass at the renal pelvis with areas of cystic degeneration .

(d) IV-DSA of the same case showing a hypovascular space-occupying lesion at the medial and upper portions of the Lt. kidney with no evidences of pathological circulation.

Fig (12) Calcified Rt. renal cyst.

(A) U.T.P showed a rounded calcific shadow overlying Rt. renal region.

(b) Nephrotomography of the same case showing well-defined space occupying lesing at the area between the upper and middle calyces with radiographic density less than that of the parenchyma & calcification at the medial aspect.

(C) Ultrasonagram showing a well circumscribed, thin-walled cystic lesion with dense focus casting acoustic shadow at its infero-medial protion.

(D) IV-DSA of the same case showing no difinite vascular abnormalities.

(E) IA-DSA showing slight stretchement and displacement of the peripheral intrarenal vessels at the site of the lesion with no evidences of pathological vasculature.

Fig (13) renal abscess
(A) Nephrotomography of the Lt. kidney showed a large space occupying lesion at the lateral aspect with medial displacement and stretching of the pelvic-alyceal system.

(B) Ultrasonography of the same case showing a sonolucent lesion with many internal echoes and showed ill-defined cortical' outlines.

(C) IV-DSA of the same case showing a large hypovascular space occupying lesion occupying the lateral and mid portion of the Lt. kidney. The capusular artery is noted tortuous and hypertrophied. No evidences of pathological vessels.

Fig (14): Lipofibromatosis

(A) U.T.P. showing enlarged soft tissue shadow of the Lt. kidney with central low radiographic density than the renal parenchyma, Multiple stones were seen.

(b) I.V.P of the same case showing a central well-defined space occupying lesion of the Lt. kidney in the form of elongation and stretching of the major calyces and dilatation of the minor calyces with impression from the sinus side.

(C) Ultrosonography of the same case showing central lesion of solid hyperechogenic pattern at the Lt. hilum and extending to the peripheral region compressing the adjacent calyces multiple stones were seen.

(D) IV-DSA of the same case showing a large hypovascular occupying lesion with displacement and stretchement of the main renal artery and intrarenal vessels, medial displacement of the aorta was noted.

Fig (15) :Lt. renal mass with infilteration of the renal vein.
Non visualised renal vein in a delayed image. Evidences of increased vascularity are seen at the site of the renal vein mostly due to its infilteration by a malignant thrombus.

Fig (16) : chronic renal abscess:-
(A) U.T.P. & I.V.P showing poor excretory function of the Lt. kidney with evidences of a space occupying lesion at its lateral aspect displacing the pelvicalyceal system medially,multiple stones were noted at the lower calyx.

(B) A mass of illdefined outlines and heterogeneous echo-pattern is seen at the upper pole and mid-zon of the kidney displacing the pelvicalyceal echoes postero-medially.

(C) Ultrasound guided puncture of the lesion for diagnostic aspiration.

(D) IV-DSA of the same case showing splayed and stretched intrarenal vessels with no evidences of pathological circulation or abnormal vessels.