

## LEIOMYOSARCOMA OF THE KIDNEY — A CASE REPORT WITH REVIEW OF THE LITERATURE

By Lee Swee Kok, M.B., B.S., D.C.P.D. Path.  
(Department of Pathology, Singapore)

and

Laurence F. Tinckler, M.D., Ch.M., F.R.C.S., F.A.C.S., D.T.M. & H.  
(Surgical Professorial Unit, University of Singapore)

Malignant smooth muscle tumours of the kidney are uncommon and to our knowledge no example of renal leiomyosarcoma in Singapore and Malaysia has been documented. Therefore, the following case report is presented. In addition, all the cases recorded in the literature are reviewed and some clinical features outstanding in these patients brought out.

### CASE REPORT

The patient was a Chinese female, aged 40, who had noticed a swelling progressively increasing in size in the right side of the abdomen for the previous six months. Apart from losing about 20 pounds in weight during that period, there had been no associated symptoms. In particular there were no symptoms referable to the urinary tract. Recently she had experienced anorexia and felt generally unwell. At no time had she felt pain or was there haematuria.

On clinical examination she was seen to be ill and there was a very obvious swelling to be seen on the right side of the abdomen and which moved with respiration. The mass was easily ballotable from the loin, somewhat lobular in shape and firm in consistency. It was not tender to palpation. Her general appearance was consistent with her history of weight loss. There were no other physical signs of significance. Her blood pressure was 100/60.

On clinical grounds it was considered likely that the abdominal swelling was arising from the right kidney. An intravenous pyelograph showed on the control film areas of calcification in the site of the right kidney, which failed to concentrate the dye, whereas the function of the left kidney was good with a normal pyelographic picture (Fig. 1).

The radiological appearances were those of either a calcified renal carcinoma or calcification in a kidney destroyed by tuberculosis, a so-called auto-nephrectomy.

During the period that the patient was in hospital under investigation and being prepared for operation the swelling appreciably increased in size.

Investigations: Urine culture for myobacterium tuberculosis—negative. Urine culture—sterile. Blood haemoglobin—65%, white cell count—6,300/cu. mm. Blood urea—24 mgm.%. Urine microscopy—no red cells, occasional white cells, occasional epithelial cells, no casts, no crystals.

Exploration of the right kidney was performed on the 10th June 1966. A long right paramedian incision was made and a transperitoneal approach

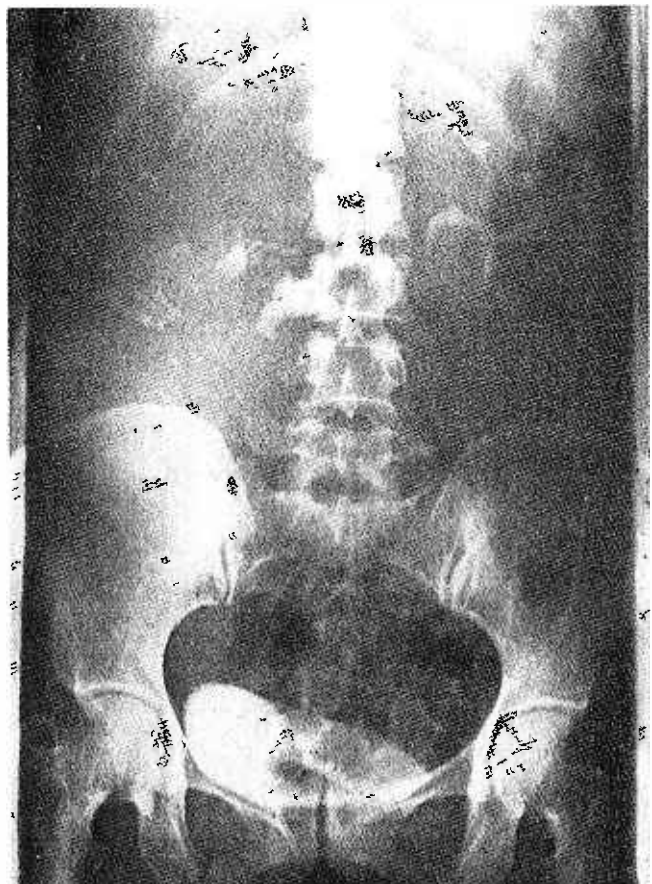


Fig. 1. Intravenous pyelograph shows normal pyelonephric appearances on the left side, no renal function on the right and calcification in the renal area on that side.

to the right kidney carried out. The renal origin of the abdominal mass was confirmed, and increased vascularity of the perinephric tissue was noted. Right radical nephrectomy was performed from which the patient made an uneventful recovery.

## PATHOLOGY

On gross examination, the specimen consisted of a large firm, nodular mass, measuring 15 cm. × 12 cm. × 9 cm. the reniform shape still being roughly preserved (Fig. 2). It appeared to be enclosed by the remaining compressed renal tissue, from which the tumour mass could be readily separated. The cut-surface revealed firm, pinkish tumour tissue which was divided by fibrous strands into lobules of varying sizes (Fig. 3). Occasional areas of central necrosis and calcification were also noted. A length of normal looking ureter could be seen emerging from the mass, near its centre (Fig. 2).



Fig. 2. External view of the specimen shows nodular appearance. A short stump of ureter is attached to the middle of the left margin.

Histologically, the tumour consisted of irregularly arranged spindle-shaped cells which showed whorled patterns in some areas. The nuclei were round, oval, elongated and of varying sizes; they were hyperchromatic and they exhibited numerous mitoses. Some multinucleated cells were also present. Myofibrils were demonstrated in the cells by means of special stains—Phosphotungstic acid haematoxylin, Mallory's Trichome (Figs. 4 and 5). Compressed and fibrotic renal structure was discernible at the periphery of the main tumour mass. Metastatic lesions were identified in a few lymphnodes removed together with the right kidney.

## DISCUSSION

A survey of the literature shows that the case of renal leiomyosarcoma described by Pick (1893) in a dissertation quoting Ranke is probably the first such lesion reported. There is little doubt about its rarity (Mintz, 1937; Bruce and McNaught, 1954), as only 41 other cases, excluding the present one, have been documented (Table 1). Kerr's (1954) case was associated with a leiomyosarcoma of the stomach, and Leopold and Mogg (1964) described a combined carcinoma-leiomyosarcoma in an adult kidney.

Leiomyosarcoma of the kidney usually manifests itself between the ages of 40 years and 70 years (Bazaz-Malik and Gupta, 1966). The oldest patient was an 86-year-old woman (Tetelman and Lisa, 1945) and the youngest a 3-year-old boy (Pick, 1893). It occurs more frequently in females than in males, in the approximate ratio of 2:1. The right kidney is involved about twice as often as the left, and there is one instance where both kidneys are affected (Bhende, 1952).

Lumbar pain or tenderness and a lumbar mass on the side of the involved kidney are the commonest presenting symptoms. Haematuria occurs occasionally. Often only one of the mentioned symptoms presents itself, as in our patient whose complaint was that of a lumbar mass with no abdominal discomfort or haematuria. The duration of symptoms is usually from one month to one year, though histories as short as nine days (Briggs, 1955) and as long as ten years (Leopold and Mogg, 1964) have been recorded.

The period of survival after operation is usually not more than one year. Only one patient was reported to be well eighteen months after operation (Smith, 1935). Our own subject is apparently well in the sixth post-operative month.

The origin of this tumour is obscure. The commonly implicated sites are the renal capsule, smooth muscle rests in the renal parenchyma,

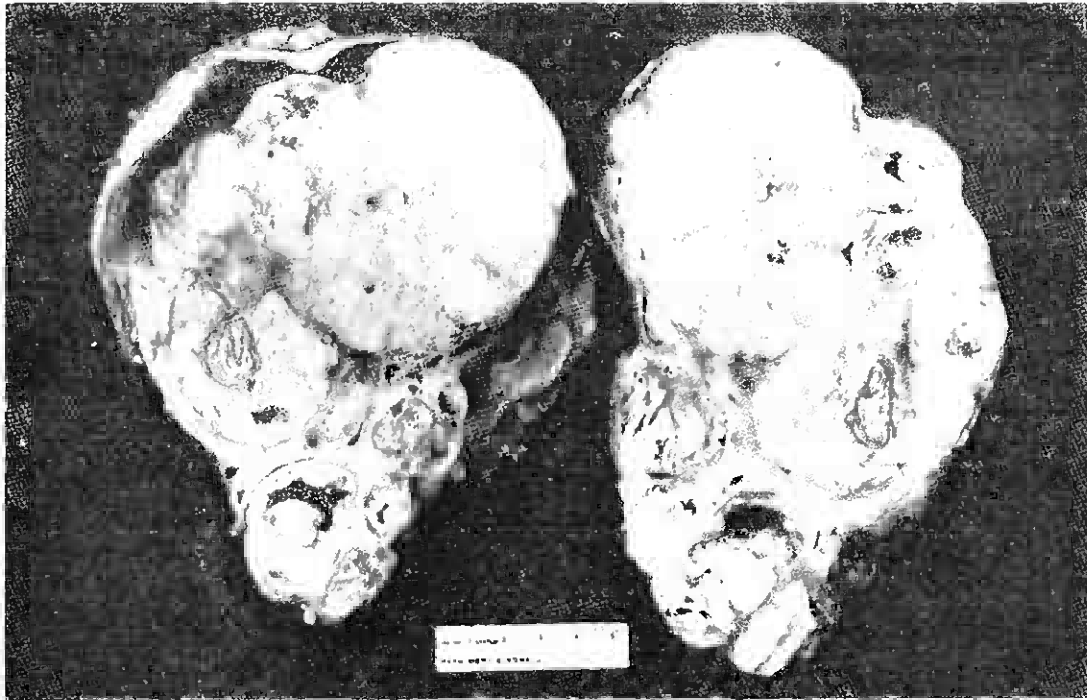


Fig. 3. Cut-surfaces show lobulated pattern with central areas of necrosis.

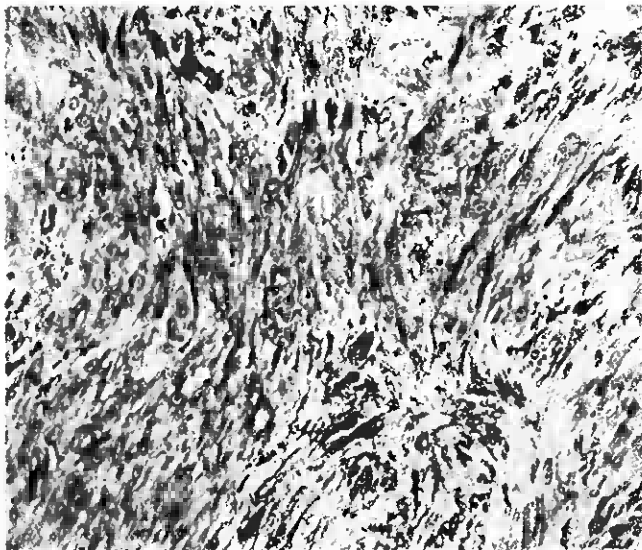


Fig. 4. Low-power photomicrograph shows irregularly disposed spindle cells. In some parts attempts at whorling are visible. (Phosphotungstic acid haematoxylin  $\times 150$ ).

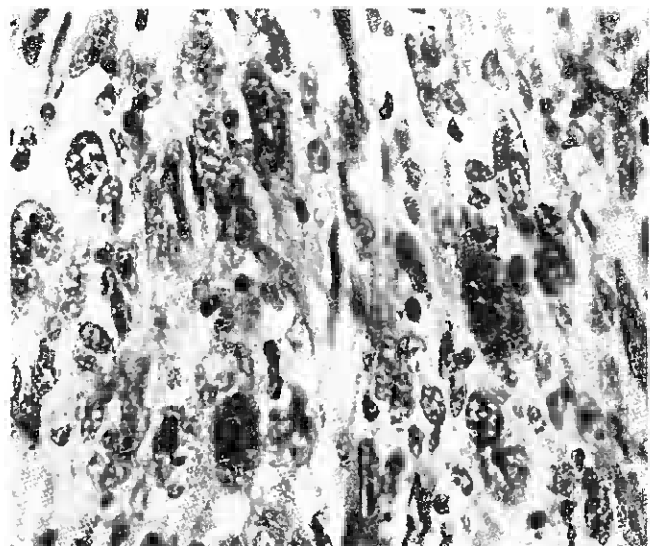


Fig. 5. High-power photomicrograph shows hyperchromatism and pleomorphism of round, oval and elongated nuclei. A few multinucleated cells are also present. (Haematoxylin and Eosin  $\times 500$ ).

TABLE I  
REPORTED CASES OF RENAL LEIOMYOSARCOMA

No.	Author	Year	Age	Sex	Symptoms	Duration	Side	Physical and Pyelogram Findings	Gross Pathological Findings	Metastasis	Survival
1	Pick quoting Ranke	1893	3	M	Symptoms of hydro-nephrosis	9 months	L	N.S.	N.S.	N.S.	N.S.
2	Berry	1919	72	M	Right Lumbar tenderness	3 months	R	N.S.	Tumour upper pole 15 x 10 x 7 cm.	N.S.	N.S.
3	Brandt	1919	68	M	N.S.	N.S.	L	N.S.	Tumour upper pole 13 x 11 x 10 cm.	Lungs, liver	N.S.
4	Mackenzie and Parkins	1929	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
5	Berry	1929	26	F	Right Lumbar pain	14 months	R	N.S.	Large mass lower pole	Locally infiltrating	N.S.
6	Crosbie and Pinkerton	1932	35	F	Right Lumbar pain	6 months	R	N.S.	Large mass upper pole	N.S.	N.S.
7	Cooke	1933	60	F	Right Lumbar mass	5 years	R	N.S.	Large mass whole kidney	N.S.	Died 1 year after operation
8	Swan	1933	71	M	Haematuria	N.S.	N.S.	N.S.	N.S.	N.S.	Died 1 year after operation
9	Smith	1935	N.S.	N.S.	Haematuria	N.S.	N.S.	N.S.	N.S.	Locally infiltrating	Well 1½ years after operation
10	Mintz	1937	45	F	N.S.	6 months	L	Deformity of calyces	8 cm. in diameter	N.S.	N.S.
11	Mintz	1937	41	F	Left Lumbar pain	1 year	R	Hydronephrosis	628 gm.	N.S.	N.S.
12	Mintz	1937	37	M	Abdominal mass	5 months	L	Displacement of ureters	Inoperable bilateral tumours	N.S.	Died 5 days after operation
13	Mintz	1937	46	F	Haematuria	5 weeks	R	Left abdominal mass	Mass lower pole	N.S.	N.S.
14	Patch	1937	55	M	Right Lumbar pain	2 weeks	R	Filling defect	Tumour whole kidney	Mesenteric lymph nodes	N.S.
15	Weisel, Dockerty and Priestley	1943	N.S.	N.S.	Right Lumbar pain	N.S.	N.S.	Deformity of calyces	13 x 9 x 5 cm.	N.S.	N.S.
16	Weisel, Dockerty and Priestley	1943	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
17	Weisel, Dockerty and Priestley	1943	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
18	Crabtree	1944	43	F	Left Lumbar mass	N.S.	L	N.S.	1000 gm.	N.S.	N.S.
19	Tetelman and Lisa	1945	86	F	Right Lumbar mass	N.S.	R	N.S.	1000 gm.	Mesenteric lymph nodes	N.S.
20	Tetelman and Lisa	1945	74	F	Autopsy material	N.S.	L	N.S.	2 x 2 cm.	N.S.	N.S.
21	Bagolan	1950	41	F	Right Lumbar pain	N.S.	R	N.S.	Masses both kidneys	N.S.	Died 1 day after operation
22	Blum and Frehling	1951	25	F	Left Lumbar lump	2 years	L	Deformity of lower pole	Large mass lower pole	N.S.	Well 8 months after operation
23	Blum and Frehling	1951	65	F	Right Lumbar lump and pain	4 years	R	Displaced calyces	Large mass upper pole	N.S.	N.S.
24	Petkovic	1951	48	M	Left Lumbar pain	N.S.	L	Deformed lower calyces	Lower pole	N.S.	Died 6 months after operation
25	Petkovic	1951	52	F	Left renal colic. Haematuria	N.S.	L	Deformed upper calyces	Upper pole	N.S.	Died 1 year after operation

TABLE 1 (Continued)  
REPORTED CASES OF RENAL LEIOMYOSARCOMA

No.	Author	Year	Age	Sex	Symptoms	Duration	Side	Physical and Pyelogram Findings	Gross Pathological Findings	Metastasis	Survival
26	Kretschmer	1952	62	M	Right Lumbar pain Haematuria	3 months	R	Filling defect Right pelvis	Adherent large mass	N.S.	Well 9 months after operation
27	Bhende	1952	30	M	Autopsy material	N.S.	L	N.S.	6 cm. in diameter	N.S.	N.S.
28	Bhende	1952	24	M	Autopsy material	N.S.	R	N.S.	Kidney 24 × 14 × 8 cm.	N.S.	N.S.
29	Bhende	1952	10	F	Autopsy material	N.S.	Both	N.S.	Multiple nodules	N.S.	N.S.
30	Bruce and McNaught	1954	59	F	Loss of weight Right Lumbar lump	N.S.	R	No function at all	Large mass lower pole	Inguinal and axillary lymph nodes	Recurrence after 9 months
31	Higbee and Atkin	1954	68	F	Right Lumbar pain	6 weeks	R	Double right kidney with mass	Mass upper pole	N.S.	N.S.
32	Lazarus and Friedman	1954	39	M	Painless haematuria	6 months	R	Defective filling upper pole	20 × 15 × 15 cm.	Lungs, liver	Died 7½ weeks after operation
33	Kerr	1954	44	M	N.S.	N.S.	R	N.S.	Lower pole 8 × 7 × 5 cm.	N.S.	N.S.
34	Briggs	1955	35	F	Profuse painless haematuria	9 days	R	Gross deforma- tion of calyces	N.S.	N.S.	N.S.
35	Briggs	1955	76	F	Right Lumbar lump	3 weeks	R	Large mass in right flank	Growth at lower pole	Locally infil- trating	Well 10 months after operation
36	Briggs	1955	80	F	Left abdominal pain	1 month	L	Non-filling of left upper major calyx	24 cm. in diameter	N.S.	Well 3 months after operation
37	Briggs	1955	64	F	Increasing tiredness and weight loss	1 year	L	Mass in left loin Non-function- ing left kidney	30 cm. in diameter	N.S.	Died 7 months after operation
38	Frehling and Lev	1956	51	M	Right Lumbar pain	N.S.	R	N.S.	N.S.	N.S.	N.S.
39	Gupta, Nagrath and Bhagwat	1963	60	F	Right Lumbar pain	5 months	R	N.S.	Mass 10 × 7 × 3 cm.	N.S.	N.S.
40	Leopold and Mogg	1964	48	M	Haematuria Left renal pain Haematuria later	10 years	L	Non-functioning kidney mid- dle and upper calyces	Upper part kidney 14 × 12 × 10 cm.	N.S.	N.S.
41	Lamarina	1964	63	F	Left Lumbar pain	2 years	L	Mass in loin	15 × 13 × 7 cm.	Lung	Alive after 1 year
42	Bazaz, Malik and Gupra	1966	48	M	Haematuria			Tender mass in left lumbar region			
43	Lee and Tinckler (present case)	1966	40	F	Right Abdominal lump Weight loss	6 months	R	Deformity of calyces Mass in right loin No function on right side Calcification	Mass 15 × 12 × 9 cm. replacing kidney	Lymph nodes in right renal hilus	Well 6 months after operation

N.S. — Not stated.

walls of renal vessels and the renal pelvis (Zuckerman *et al*, 1947; Lazarus and Friedman, 1954; Crosbie and Pinkerton, 1932; Bhende, 1952). In our case, it had probably arisen from the region of the renal pelvis and had enlarged to compress the renal parenchyma.

The tumour is locally infiltrating (Berry, 1929; Smith, 1935) and is known to metastasise to lungs, liver (Brandt, 1919; Lazarus and Friedman, 1954), mesenteric lymphnodes (Patch, 1937; Tetelman and Lisa, 1945), and inguinal and axillary lymphnodes (Bruce and McNaught, 1954). Our patient showed secondary deposits in the lymphnodes in the right renal hilus, but no lymphnode involvement elsewhere.

### SUMMARY

A case of renal leiomyosarcoma in a 40-year-old Chinese female is described. This brings the number of such cases reported in the literature to 43. The clinical features, prognosis and commonly believed sites of origin of the growth are briefly reviewed.

### ACKNOWLEDGEMENTS

Our thanks are due to Mr. T. T. Tan for preparing the photographs, and Miss Y. H. Chan for typing the script.

### REFERENCES

1. Bagolan, P. (1950): "Rare case of bilateral leiomyosarcoma of the kidneys." *Timori*, 24, 75.
2. Bazaz-Malik, G. and Gupta, D. N. (1966): "Leiomyosarcoma of the kidney." *J. Urol.*, 95, 754.
3. Berry, G. A. (1919): "Report of three cases of combined tumours of kidney in adults." *J. Med. Research*, 40, 459.
4. Berry, W. E. (1929): "Leiomyosarcoma of the Kidney." *Canad. Med. Ass. J.*, 20, 280.
5. Bhende, Y. M. (1952): "Plain muscle tumours of kidney." *Indian J. Med. Sci.*, 6, 747.
6. Blum, E. and Frehling, L. (1951): "Two anatomoclinical observations of leiomyoblastic sarcoma of the kidney." *J. Urol. Med.*, 57, 46.
7. Brandt, F. (1919): "Über 2 Fälle von Myosarkom in der Gegend d. Nierenbeckens." Inaugural Dissertation, Greifswald.
8. Briggs, G. W. (1955): "Leiomyomatous tumours of kidney." *Austral. N.Z.J. Surg.*, 25, 118.
9. Bruce, J. and McNaught, G. H. D. (1954): "Leiomyosarcoma of kidney." *Brit. J. Urol.*, 25, 114.
10. Cooke, W. E. (1933): "Malignant leiomyoma of the kidney." *J. Path. Bact.*, 37, 157.
11. Crabtree, E. G. (1944): "Leiomyoma of kidney associated with haemorrhagic cyst." *J. Urol.*, 52, 480.
12. Crosbie, A. H. and Pinkerton, H. (1932): "Malignant leiomyoma of kidney." *J. Urol.*, 27, 27.
13. Frehling, S. and Lev, M. (1956): "Leiomyosarcoma of kidney." *Arch. Surg.*, 73, 346.
14. Gupta, J. C., Nagrath, C. and Bhagwat, A. G. (1963): "A leiomyosarcoma of kidney." *Ind. J. Path. Bact.*, 6, 66.
15. Higbee, D. R. and Atkin, D. M. (1954): "Leiomyosarcoma in a double kidney." *J. Urol.*, 71, 166.
16. Kerr, J. A. (1954): "Gastric and renal leiomyosarcoma." *Brit. J. Surg.*, 41, 478.
17. Kretschmer, H. L. (1952): "Leiomyosarcoma of the kidney." *J. Urol.*, 68, 36.
18. Lamarina, A. (1964): "Malignant leiomyoma or leiomyosarcoma of the kidney." *Osped Maggiore*, 59, 595.
19. Lazarus, J. A. and Friedman, F. (1954): "Leiomyosarcoma of the kidney." *Amer. J. Surg.*, 87, 251.
20. Leopold, J. G. and Mogg, R. A. (1964): "A combined carcinoma-leiomyosarcoma of an adult kidney." *Proc. Roy. Soc. Med.*, 57, 933.
21. MacKenzie, D. W. and Parkins, G. A. (1929): "Renal tumours." *Canad. Med. Ass. J.*, 20, 616.
22. Mintz, E. R. (1937): "Sarcoma of the kidney in adults." *Ann. Surg.*, 105, 521.
23. Patch, F. S. (1937): "Three unusual primary kidney tumours." *Brit. J. Urol.*, 9, 339.
24. Petkovic, S. (1951): "Myomatous tumours of the kidney." *Urol. and Cutan. Rev.*, 55, 730.
25. Pick, S. (1893): "Das primare Nierensarkom." Inaugural Dissertation, Würzburg.
26. Smith, G. G. (1935): "Neoplasms of the kidney and ureter." *Amer. J. Surg.*, 30, 130.
27. Swan, R. H. J. (1933): "New growths of the kidney." *Brit. Med. J.*, 1, 606.
28. Tetelman, M. M. and Lisa, J. R. (1945): "Leiomyosarcoma of the kidney." *J. Urol.*, 54, 224.
29. Weisel, W., Dockerty, M. G. and Priestley, J. T. (1943): "Sarcoma of the kidney." *J. Urol.*, 50, 564.
30. Zuckerman, I. C., Kershner, D., Laytner, B. D. and Hirshl, D. (1947): "Leiomyoma of the kidney." *Ann. Surg.*, 126, 220.