blind loops (Goldman *et al.*, 1970), and recently Gleeson (1971) has shown that there is in rats slower cell turnover in Thiry Vella loops of small intestine compared to normal small intestine. Perhaps primary epithelial neoplasms should be more common in blind loops of duodenum than in normal duodenum. The extreme rarity of such tumours in such loops suggests that this is not the case.

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Liposarcoma of the kidney

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Summary

Two cases of liposarcoma of the kidneys were described, these being the thirty-sixth and thirty-seventh cases documented in the world literature. The association between renal liposarcoma and tuberous sclerosis was discussed. The presenting symptoms and signs of this condition were noted. A search of the recent world literature has been carried out.

Introduction

Although liposarcoma is the most common neoplasm of the retroperitoneum, it is a rare tumour in the kidney.

Case reports

Case 1

A female, aged 49 years, was admitted as an emergency to Dudley Road Hospital under the care

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of Mr A. O. Wilson on 4 July, 1972. 9 hr prior to her admission, she suddenly developed a pain in the back, radiating towards the front and down the left side of her abdomen. There was no shoulder pain. She vomited five times. There were no abnormal bowel or urinary symptoms.

On examination, the patient was in pain. Her pulse was 96 beats/min, regular. BP 150/110 mmHg. There was guarding and tenderness involving nearly the whole of the left half of her abdomen. The bowel sounds were faint but present. There was no evidence of peritonitis. There was a lower abdominal scar from a hysterectomy performed for uterine fibroids in 1963.

Investigations. Hb 13.2 g/100 ml; white cell count 14,500/mm³; electrolytes, liver function tests and serum amylase were all normal. Straight X-rays of the abdomen were normal. They showed no gas under the diaphragm and there was no evidence of

any radio-opaque calculus in the urinary tract. Chest X-ray was normal.

The diagnosis was not apparent at the beginning. After excluding acute pancreatitis it was thought that she might have had a small leakage from a gastric ulcer. She was treated by intravenous fluids, gastric aspiration and analgesic. Her initial improvement was slow. On ward testing, her urine contained albumin and a trace of blood on two occasions.

Intravenous pyelogram showed an intrarenal space-occupying lesion in the left kidney (Fig. 1). The right kidney was normal. Arteriogram revealed a considerable enlargement of the left kidney, which was extensively involved by a tumour. The only normal looking area was a small cap at the upper pole. In the mid-left kidney was a cystic area of necrotic tumour (Fig. 2). A cavogram and left renal venogram showed a normal inferior vena cava and left renal vein which filled to the hilum.

Operation. On 12 July, 1972, left nephrectomy was carried out through a left loin incision below the twelfth rib. The extra renal fat was blood-stained. The peritoneum was opened and there was blood-staining of the mesocolon and a little old blood was found in the peritoneal cavity. Mobilization of the kidney through the haematoma was difficult. The kidney was necrotic and rupturing in parts. There was a large retroperitoneal extension of tumour behind the splenic flexure and this tumour mass shelled out easily.

Pathology and histology. The kidney with tumour measured $15 \times 10 \times 8$ cm and there was a separate piece of tissue $9 \times 5.5 \times 4$ cm. The tumour tissue was yellowish, homogeneous and appeared to be infiltra-

FIG. 2. Arteriogram showing the left kidney was extensively involved by a tumour (Case 1).

FIG. 3. Histological appearance ($\times 18$) of the tumour in Case 1. Most of the tumour consisted of lipoblasts, the remainder being spindle shaped cells.

FIG. 1. Intravenous pyelogram showing a space-occupying lesion in the left kidney (Case 1).

FIG. 4. Larger manifestation ($\times 700$) showing the histological appearance of the tumour in Case 1.

ting into the substance of the kidney. The separate mass consisted entirely of numerous well-differentiated pleomorphic lipoblasts. Numerous blood vessels were scattered in the parenchyma of this tumour. Similar tumour cells were seen to infiltrate the substance of the kidney. One area showed spindle shaped cells only, suggestive of a fibrosarcomatous picture (Figs. 3 and 4).

The appearances suggested that the majority of the tumour was a well-differentiated liposarcoma, while a small area showed spindle shaped cells which might be of mixed elements, e.g. lipofibrosarcoma.

She made a good post-operative recovery. In view of the extra-renal tumour extension, she was given a course of megavoltage radiotherapy.

She was seen at follow-up clinic 3 months later, when she was reported to be doing well.

Case 2

A 63-year-old man was referred to the diabetic clinic by his general practitioner, who found glycosuria after the patient complained of increasing thirst, dryness of mouth, anorexia and polyuria. He

also complained of weight loss and vague left-sided abdominal discomfort. Apart from the polyuria he had no other urinary symptoms and there had never been any haematuria.

On examination, there was a large hard irregular mass, occupying the left flank and anteriorly reaching almost to the umbilicus.

Investigations showed that the blood sugar was 480 mg/100 ml; Hb 14.6 g/100 ml; white cell count 7000/mm³ with a normal differential count; blood urea 80 mg/100 ml and ESR 20 mm/hr.

The patient was put on the waiting list for early admission, with a view to further investigation. He was placed on a 1750 calorie diet and Diabinese 250 mg each morning, and later 125 mg in the evening. With this regimen, the blood sugar fell to 130 mg/100 ml at the time of admission on 18 February 1965.

Chest X-ray was normal except for a little unfolding of the aorta. An intravenous pyelogram showed a large left kidney and the appearances suggested a large tumour which was flattening and obstructing the pelvicalyceal system of the kidney. The right kidney appeared normal.

Operation was carried out on 23 February 1965. After 250 mg of Diabinese and 50 g of glucose 3 h before operation, the abdomen was opened through a left paramedian incision. There was no free fluid and no liver metastases. The large tumour occupying the left flank was exposed by mobilizing the left colon medially. The surface of the tumour had a number of cysts containing bloodstained fluid, and it was regarded as being other than a hypernephroma. The mass was adherent to the quadratus lumborum and psoas muscles. The kidney was seen to be blended with the growth. After division and ligation of a series of large veins and the main renal artery, the kidney and tumour were removed.

He made an uneventful recovery and was discharged home on 7 March 1965.

Pathology. The specimen was an oval mass 19 $\times$ 14 $\times$ 10 cm, weighing 1315 g. Part of the surface was recognizably renal, and there were many dark cysts of varying size. Transection revealed a greatly enlarged kidney with numerous small cysts and in places replacement by fleshy growth not resembling hypernephroma.

Microscopy revealed a mesenchymal tumour forming much fat and with some proliferation of smooth muscle in the capsular areas. In places, the tumour was pleomorphic with giant cells and mitotic activity. The appearances suggested a diagnosis of liposarcoma.

Prognosis. The patient lived for 13 months, dying with metastatic disease.

Discussion

In 1958, Williams & Savage reviewed the world literature on liposarcoma of the kidney and found twenty-nine documented cases. They added a case of their own. MacDermott & Kennedy (1960) mentioned that a case reported by Ehrmann in 1914 should have been included. Of the twenty-nine recorded cases of renal liposarcoma reviewed by Williams & Savage (1958), ten were associated with the condition of tuberous sclerosis. In this condition, there is hypertrophic nodular gliosis within the brain, and there may be associated rhabdomyomata of the heart, retinal phacomata, adenoma sebaceum of the face with butterfly distribution and renal neoplasms. These patients may suffer from mental deficiency or epilepsy. Many patients with tuberous sclerosis die of cerebral manifestations before they reach the age of 20. Of those that survive, the renal lesion may remain occult and only show itself at a later date when malignant change has supervened.

In describing the renal neoplasms, Hulse & Palik (1951) used the term 'renal hamartoma', implying dysplasia rather than neoplasia. Renal liposarcoma can be placed in the malignant fringe, for the association of renal liposarcoma with a general defect of tissue combination (termed hamartosis), in fact with tuberous sclerosis, has been established.

On the other hand, renal liposarcoma can occur without the changes of tuberous sclerosis, as in the cases presented in this paper. The usual presentation of liposarcoma is with pain, renal mass, anorexia and weight loss. Haematuria is usually absent. Nephrectomy was carried out in twenty-one of the twenty-nine cases. Operation has sometimes proved haemorrhagic and formidable. Of the twenty-one nephrectomies, two died within 72 hr and one died 28 days later. Of the survivors, the prognosis has been variable, but the outlook was usually good. Cases were reported to be alive and well 6, 9½ and 12 years after operation. One patient was still alive 23 years after nephrectomy. Radiotherapy is usually not helpful, as these tumours are generally radio-resistant.

Since the paper published by Williams & Savage (1958), reports of further cases have been scanty, especially in the literature written in the English language. MacDermott & Kennedy (1960) documented the thirty-second case in the world literature. Their patient remained symptom-free 5 years after nephrectomy and radiotherapy. The thirty-third case was reported by David & Tudose (1968). Their patient was initially diagnosed as a case of infected hydronephrosis. Nephrectomy was carried out. At the time of operation, para-aortic and lumbar lymphadenopathies were noted. Radiotherapy was given 1 year after operation and the patient was reported to be in good health 4 years post-operatively. Two further cases have been reported, by Iwanowska (1968) in Polish and by Bernard & Dorman (1969) in Spanish.

The two cases documented in this paper are the thirty-sixth and thirty-seventh cases of liposarcoma of the kidney reported in the world literature. Care has been exercised to exclude liposarcoma originating from the capsule of the kidney.

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