MALIGNANT HYPERTENSION CURED BY UNILATERAL NEPHRECTOMY

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The classical work of Goldblatt (1934 and 1937) and of Wilson and Byrom (1939), demonstrating the development of hypertension following unilateral renal ischæmia and the return of the blood pressure to normal following removal of the renal lesion, gave a great stimulus to the clinical study of hypertension. As a result it is clear that in man, as in the experimental animal, renal ischæmia gives rise to hypertension. If the lesion is confined to one kidney and that kidney is removed before permanent hypertensive changes have developed the hypertension may be cured. Many clinical cases have now been investigated and the commonest cause of unilateral renal disease producing hypertension appears to be chronic atrophic pyelo-nephritis (Braasch, 1942). How this leads to renal ischæmia is not clear but Barker and Walters (1940) have suggested that there may be an obstruction to the renal arteries in these cases. Among other conditions found to produce hypertension have been atherosclerosis of the renal artery, pyonephrosis, renal tuberculosis, neoplasm, and trauma. Apparent cure of the hypertension following removal of the damaged kidney was first reported by Butler (1937) in a case of pyelo-nephritis, and similarly successful results have been reported by others. (Patch, Rhea, and Codnere, 1940; Barker and Walters, 1940; Movin, Ohlsen, and Pedersen, 1944; Powers and Murray, 1942; Platt, 1941, etc.)

Successful reports of nephrectomy have also been made in renal tuberculosis (Kennedy, Barker, and Walters, 1941), in tumour (Koons and Ruch, 1941; Richardson and Smart, 1941), following trauma (Farrell and Young, 1942), and in atherosclerosis of the renal artery (Leiper, 1944).

However removal of the offending kidney has by no means always resulted in cure of the hypertension and in some cases in which the immediate effects of the operation were gratifying the blood pressure later returned to the same level as before operation. In 1940 Schroeder and Fish analysed reported cases and laid down the following criteria for operation.

The onset of hypertension should be recent.

The renal lesion should be confined to one kidney and should be such that diminution of function has occurred in that kidney.

Renal function should be within normal limits.

Retinitis should be absent.

Arterial pressure should be persistently elevated.

The whole question has recently been reviewed in detail by Sensenbach (1944) who was only able to find 5 cases in which nephrectomy was successful after two years: he agreed in the main with the above criteria. However the cases reported by Platt (1941), by Kennedy, Barker, and Walters (1941), by Powers and Murray (1942) and by Leiper (1944) show that the presence of papilloedema and retinitis (malignant hypertension) is by no means a contra-indication to nephrectomy.

The object of this paper is to report two cases of this type in which the hypertension was apparently cured by unilateral nephrectomy.

CASE NOTES

Case 1. A man, aged 32, was admitted to hospital on February 2, 1942, with attacks of severe headache and vomiting for about two months. These attacks came on about once a week and his sight gradually became blurred in the left eye. He had had occasional headaches from January till September 1941 when he was discharged from the R.A.F. on account of "low mentality and lack of confidence." In September 1941 he had a sudden severe pain in the left loin, which lasted three days and was so bad that he could not stand. On admission to hospital the blood pressure was 210/130. Both fundi showed papilloedema and small exudates; this was more marked in the left eye which showed a macular star. There was no clinical or radiological evidence of cardiac enlargement. The urine contained a trace of

FIG. 1.—Blood pressure readings in Case I.

albumen, but no cells or casts were seen in the centrifuged deposit. Blood non-protein nitrogen was 45 mg. per 100 c.c. The urea concentration in the urine after 15 g. of urea was 2.8 per cent after 1 hour, 2.5 per cent after 2 hours, and 2.4 per cent after 3 hours.

Intravenous pyelography showed very poor excretion of dye on the left side. Cystoscopy showed no abnormality in the bladder, but no dye was excreted from the left ureter 15 minutes after injection, although excreted in 5 minutes from the right side. An ascending pyelogram showed small shrunken calyces on the left side. With rest in bed the blood pressure fell slightly but still remained elevated.

On March 4 a left nephrectomy was performed by Mr. FitzGibbon. The blood pressure fell to normal (115/70) seventeen hours after the operation and was still normal when last seen two years later (125/85). The retinal lesions have steadily improved, the papilloedema and exudates clearing up completely. Vision is still impaired in the left eye.

The pathological report on the kidney is as follows:—"The kidney weighs only 75 grams. This reduction in size is due to the presence of several old infarcts. There is a rim of fresh hæmorrhage just beneath the capsule; presumably due to trauma at the time of operation.

The renal vessels have been divided close to the hilum and the cut ends showed no apparent gross lesion. The pelvis of the kidney gives no sign of dilatation or infection.

Histologically several sections show old healed infarcts but an interesting feature is the presence of large areas of relatively ischæmic kidney tissue, with viable glomeruli lying in a fibrous matrix containing shrunken tubules. One branch of the renal artery, just within the hilum of the kidney, shows a remarkable lesion in its wall. The lumen is patent but narrowed by subintimal fibrosis and between the media and the external elastic lamella is a vascular scar containing some grains of hæmosiderin. This may well represent a healed lesion of polyarteritis nodosa."

Case 2. A Yugoslav merchant seaman, aged 20, was admitted to hospital on February 28, 1944, complaining of severe headache and increasing failure of vision. These symptoms had been present for four months. He had been invalided home from Algiers where he had

pyelogram showed a small pelvic shadow on the left side. Rest in bed produced no definite fall in blood pressure.

On March 16 a left nephrectomy was performed by Mr. Cooke. The blood pressure had fallen to 140/100 on return to the ward from the theatre and 19 hours later was 95/60: the next day it rose to 115/80 and on discharge was 130/90. Five days after operation the papilloedema had subsided considerably. It has not been possible to examine this patient again but a report from the Henry Radcliffe Convalescent Home nine months later states that his blood pressure is 135/80.

The pathological report on the kidney is as follows. "The kidney is much reduced in size, weighing only 51 grammes and measuring 8 by 5 by 2.6 cm. The kidney shape is maintained. The capsule strips easily revealing a perfectly smooth surface with no scars or hæmorrhages, but with a small, depressed, yellow infarct at the lower pole; this infarct subtends an area on the surface about 3 mm. square. The vessels are cut off close to the hilum but careful examination deep into the kidney shows no gross lesions in arteries or veins; the arteries have soft thin walls. Histological examination shows that the reduction in size of this kidney is due to a general shrinkage of the epithelium of all the renal tubules. The vessels and the glomeruli are unchanged. The general shrinkage of kidney tissue is what one would expect with partial occlusion of the renal artery; this view of the ætiology gains some support from the presence of an old infarct. The part of the renal artery left attached to the aorta probably bears the cause of the condition."

SUMMARY

Two cases are described, apparently showing complete cure of malignant hypertension following unilateral nephrectomy. In one the renal lesion appeared to be due to infarction but in the other the cause was not determined.

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