HORSESHOE KIDNEY.

A REPORT ON TWO CASES.

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(With Special Plate.)

HORSESHOE kidney is one of the most frequent of renal anomalies. Statistics obtained from the post-mortem room show ratios varying from 1 in 1,590 to 1 in 500 cases. The condition results from the fusion of either upper or lower poles of the two kidneys across the middle line. The fusion, in the majority of cases, is between the lower poles, and is composed either of connective tissue or of varying proportions of renal parenchyma, which usually lies anterior to the aorta and vena cava. The ureters, as a rule, are two in number, and arise from separate pelves. They pass downwards in front of the isthmus, and it is because of their unusual position and curvatures that a horseshoe kidney is said to be especially predisposed to such conditions as hydronephrosis, renal calculi, tuberculosis, and pyonephrosis.¹ Joly² states that stone is at least six times more common in horseshoe kidney than in normal organs.

The mere presence of a horseshoe kidney may give rise to symptoms, but these usually depend on pathological changes in the renal substance. In the first of the two cases here detailed, although extensive changes were present on one side, the condition gave rise to no symptoms whatsoever.

CASE I.

The patient was a man of 34. His medical attendant had found albuminuria during a routine examination which had been carried out prior to treatment for haemorrhoids. There was no evidence that this was of nephritic origin, and as it failed to respond to treatment he was referred to the urological clinic at the Royal Infirmary for investigation. A healthy-looking man, of medium build, he would admit to no urologic symptoms. Palpation of the abdomen revealed no tumour. X-ray examination of the urinary tract showed a large renal calculus on the right side, occupying an unusually low level. Examination of the urine showed some red blood corpuscles and epithelial cells, with scanty polymorphs in the bladder specimen. No organisms were seen on direct smear, and no growth was obtained on culture of specimens taken separately from the bladder and kidney. A bilateral pyelogram (Fig. 1) showed anomalies typical of a horseshoe kidney, with gross pathological changes in the right segment.

Description of Pyelogram (Fig. 1).—The two pelves lie adjacent to the vertebral column. On the right side the shadow of the calculus can be identified, lying behind the upper end of the opaque catheter at the level of the transverse process of the fourth lumbar vertebra. Above the level of the calculus is an extensively dilated pelvis. The calyces are also markedly dilated, and their axis is median instead of lateral. The ureter leaves the pelvis at the lateral, instead of the usual median, border. The pelvis of the left kidney is of an unusual truncated shape, and some of the upper and lower calyces lie median to it. The uretero-pelvic junction on this side is also at the lateral border.

Operation.

In November, 1928, the right kidney was exposed through a curved lumbar extraperitoneal incision. The upper pole, which appeared to be lower than normal, was separated from adhesions by blunt dissection, and delivered through the wound. On freeing the lower pole an isthmus of renal tissue could be felt extending between it and the lower pole of the left kidney in front of the great vessels. The ureter was found in front of the isthmus, and it was divided. Working from the anterior aspect, the renal vessels, which were irregular in their distribution, were cleared, divided between clamps, and ligatured. A clamp was now applied to the isthmus as near to the middle line as the incision permitted. The isthmus was then divided, immediately to the right of the clamp, and the kidney removed. A running suture was applied over the clamp, and, as the latter was withdrawn, the suture was tightened and tied. A tube was brought out through the upper angle of the wound, from the region of the cut isthmus.

The entire wound, except that part through which the tube passed, healed by first intention. During convalescence there was a continuous urinary leakage along the tract of the tube, and this, to a slight degree, is still present. The patient feels very well, his urine is clear, and he is actively engaged at his employment as an engineer. An examination of the removed kidney (Fig. 2) showed that one of the calyces had been cut across in the resected portion of the isthmus.

CASE II.

A labourer, aged 34, was referred to the urological clinic at the Royal Infirmary in December, 1929, complaining of pain in the back and haematuria. The pain was felt over the dorso-lumbar vertebrae, and had troubled him for three weeks only. It was not severe, but became aggravated after about an hour's work, which at that time consisted in stoking a furnace. He stated that during the first week following the onset of his pain the urine had been intermittently red, but that for the past two weeks it had been quite clear. Chemical examination of the urine showed a trace of albumin, but was negative for blood. Palpation of the abdomen revealed no abnormality, and pressure in the lumbo-costal angle on both sides did not elicit any tenderness. Plain x-ray examination of the urinary tract was negative. A bilateral pyelogram (Fig. 3) showed the anomalies associated with a horseshoe kidney, with a hydronephrosis in the left segment.

Description of Pyelogram (Fig. 3).—The left renal pelvis and middle calyces are extensively dilated. All the calyces, except the upper group, are directed medialwards. The ureter leaves the pelvis at about the mid-point of its lower rounded border. The right pelvis lies almost in contact with the transverse processes of the third and fourth lumbar vertebrae, and the uretero-calicine angle is diminished. The axis of the calyces is in the normal lateral direction, and the uretero-pelvic junction occupies the normal median position.

The hydronephrosis present was not considered sufficiently severe to demand surgical intervention. The patient reported recently for re-examination, when he still complained of suffering from back pains. He does not appear to be handicapped in any way, however, as a result.

For the carrying out of any successful surgical procedure on a horseshoe kidney a previous recognition of the existence of the renal anomaly is of distinct aid to the surgeon. The condition can seldom be recognized by abdominal palpation and Rovsing's sign; the causation of a characteristic pain by increasing the curvature of the lumbar spine or making the muscles of the back tense, which is relieved when the patient lies down, is not of much diagnostic value. The shadow obtained by the plain x-ray examination of a fused kidney is usually too indefinite to admit of an accurate interpretation. **Pyelography** is generally the only method whereby fusion can be recognized. The abnormalities present in a pyelogram of a horseshoe kidney are due to failure of rotation of the renal pelvis.³ In consequence the axis of the calyces is median or anterior instead of lateral, and the ureter leaves the pelvis from its lateral or anterior aspect.

Access to a horseshoe kidney is best obtained by the retroperitoneal route. The anterior transperitoneal route, as suggested by Rovsing, gives a good exposure of the isthmus, which is the most difficult part to deal with. A grave disadvantage of this approach, however, is the exposure of the peritoneum to infection. This is obviated by the postero-lateral incision, the anterior limb of the incision being carried further forward than usual. This gives an adequate exposure and working field. In dealing with the isthmus the division should preferably be made in a wedge-shaped manner, so that the cut surfaces can be approximated. A urinary fistula should be a rare sequel to the division of the isthmus, for the calyces are generally confined to the upper and middle portion of the renal mass. The lower calyx, however, extended into the isthmus in the patient operated on by me (Case I), and was therefore cut across in the course of the resection. Israel, according to Judd, Braasch, and Scholl,⁴ reported a similar case, in which one of the calyces was cut across in the removal of the transverse bar.

REFERENCES.

- ¹ Young: *Practice of Urology*, vol. ii, p. 14.
- ² Joly: *Stone and Calculous Disease of the Urinary Organs*, p. 133.
- ³ Braasch: *Urography*, p. 378.
- ⁴ Judd, Braasch, and Scholl: *Horseshoe Kidney*, *Journ. Amer. Med. Assoc.*, lxxix, 1922, No. 15, p. 1189.

ARTHUR JACOBS: HORSESHOE KIDNEY.

FIG. 1.—Calculus hydronephrosis in the right segment of a horseshoe kidney. The anomalous axis of the calyces and the relation of the ureters are shown.

FIG. 2.—Resected segment of horseshoe kidney. The large calculus can be seen within the dilated pelvis, the anterior wall of which has been opened.

FIG. 3.—Hydronephrosis in the left segment of a horseshoe kidney.

J. SALISBURY CRAIG AND
J. H. SHEARER:
OSTEITIS FIBROSA.

FIG. 1.—Pathological fracture of left humerus. Areas of rarefaction in radius and ulna.

I. H. LLOYD-WILLIAMS: BOXER'S THUMB.

FIG. 1.—Radiogram of normal thumb, showing the normal position of the bones and sesamoids.

FIG. 2.—Radiogram of boxer's thumb. Note the space between the sesamoids and metacarpal and the subluxation of the phalanx.

FIG. 2.—Areas of rarefaction in right humerus, radius, and ulna.