PARTIAL NEPHRECTOMY,

WITH THREE ILLUSTRATIVE CASES.

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THE tendency in all the operations of modern surgery is towards conservation whenever permissible and legitimate. Upon the kidney conservative operations have been but rarely performed. The importance of partial as compared with complete nephrectomy is illustrated by the experiments of Paoli, which show that if one-half of the kidney be excised, and after an interval the whole of the opposite kidney be removed, the half kidney remaining is adequate to the needs of the animal. Mr. Henry Morris relates the case of a patient from whom one kidney had been removed in Canada for tuberculous disease; one-third of the remaining kidney was subsequently excised by Mr. Morris. Five years afterwards the patient was seen, in very good health, and she was "earning her living as a working housekeeper." The performance of partial nephrectomy followed naturally upon the discovery that incisions might freely be made into the kidney substance, and that wounds so inflicted, for the purpose of extracting a calculus or exploring the kidney, healed with remarkable facility.

The notes of the following cases upon which I have operated illustrate the possibility of saving portions of the kidney in two forms of disease.

CASE I.—*Solitary Cyst of the Kidney.*

[For the notes of this case and for his assistance at the operation I am indebted to Mr. F. T. Talbot.]

E. P., female, aged 42, was admitted to the Leeds Infirmary on October 17th, 1898, sent to me by Dr. B. W. Hogarth, of Morecambe.

History.—She complained of frequent attacks of pain in the body. The attacks closely resembled renal colic, lasted two or three hours, and were almost always accompanied by vomiting. Micturition was frequent, but painless.

Condition on Examination.—A tumour almost as large as a cricket-ball could be felt on the right side of the abdomen. The tumour was spherical, smooth, tense, fluctuating, and extremely movable. Its lateral range of movement was at least 6 inches, up and down movement about 4 inches. The kidney could be felt in the loin, but the attachment of the cyst to the kidney was doubtful.

Operation (October 28th, 1898).—The abdomen was opened through Langenbuch's incision and the tumour exposed. It was found to be a cyst of the lower pole of the right kidney. The difficulty in diagnosis was accounted for by the fact that when the kidney was fixed the tumour, being narrowly pedunculated, could be moved upwards and downwards and laterally with the pedicle as a hinge. The posterior layer of peritoneum was incised and the kidney drawn out of the wound. An attempt was made to dissect the cyst from the kidney, but this was difficult; the kidney tore and bleeding was free. It was therefore determined to remove that small portion of the kidney which bore the cyst. An assistant grasped the renal artery and vein, and two incisions were made enclosing a wedge-shaped portion of the kidney between them. This portion of the kidney with the cyst was removed. The kidney wound was stitched with six deeply-buried catgut sutures. There was no bleeding. As the kidney was unduly mobile, it was freely stripped before replacement. The posterior layer of peritoneum was stitched by a continuous catgut suture and the abdominal wound closed in the usual way.

After-History.—Recovery was entirely without incident. The highest temperature recorded was 99.2°, and the most rapid pulse 104. There was a trifling amount of blood in the urine for the first day. In September, 1901, Dr. Hogarth writes that he saw the patient occasionally as he passed her house, until twelve months ago, when she left Morecambe. She was in good health and free from any discomfort in the abdomen.

Report upon the Specimen by Mr. P. J. Cambridge.

Microscopically the substance of the kidney is quite normal, and there is no evidence of chronic nephritis to be seen. The tubules in the neighbourhood of the cyst are somewhat dilated, but this is not very marked, and the cells lining them appear to be quite healthy. The cyst wall is

composed of fairly dense but highly cellular connective tissue which is somewhat sharply limited, although here and there a few irregular out-growths are seen passing into the kidney substance around for a short distance. A few compressed and distorted tubules can be distinguished imbedded in the cyst wall at intervals, but they are not numerous. Internally the wall of the cyst is covered by a single row of flattened cells

Fig. 1.—Case I. Cyst and portion of kidney removed.

with large nuclei in many places; but in others only a shaggy layer of fibrous material is to be seen. At the periphery the cyst wall becomes merged into the capsule of the kidney, but even here the distorted remains of a few tubules can be distinguished.

CASE II.—*Solitary Cyst in the Connecting Band of a Horseshoe Kidney.*

M. R., male, aged 36, sent to me by Dr. Bailey, of Horsforth, with a history of constant vomiting, pain after food, and loss of weight. Food could only be taken in small quantity, and all solids were rejected.

Condition on Examination.—A smooth, round movable swelling was felt above and a little to the right of the umbilicus. During respiration the vertical range of movement was approximately one inch. The stomach was much dilated. On inflation with CO₂ it descended two inches below the umbilicus. No waves of contraction were elicited. A diagnosis of pyloric tumour, possibly malignant, was made.

Operation.—The abdomen was opened by an incision to the right of the middle line, about five inches in length. On exposing the tumour it was found to be cystic in character, and to lie behind the peritoneum of the posterior abdominal wall. Crossing over the front of the cyst was the superior mesenteric artery close to its origin; behind the cyst lay the aorta and vena cava, and also the transverse third portion of the duodenum. The cyst was thin-walled, equal to a tangerine orange in size, tense, swollen, and unilocular. The peritoneum over it was incised and the cyst gently stripped. It was then found that on each side the cyst merged into a flat band about 1 inch in breadth and $\frac{1}{2}$ inch in thickness, continuous with the lower poles of the kidneys. The condition clearly was one of horseshoe kidney, with a solitary cyst in the connecting band. The pelvis of each lateral kidney mass was then exposed in order to determine the exact position and course of the ureters. The ureters were symmetrical, and crossed the isthmus where it joined the kidney. In stripping the peritoneum off the kidney the ureters had been carried with it. The cyst was aspirated; on the left side it seemed to spring almost directly from the kidney, a very short portion of the connecting band intervening; on the right side there was fully $\frac{3}{4}$ inch of unaltered kidney substance in the band from which the cyst sprang. On each side a wedge of the kidney substance from which the cyst grew was removed and the edges of the wounds approximated by interrupted catgut sutures introduced with an intestinal needle. There were now two separate kidneys, each with a sutured wound at the lower pole. The

incision in the posterior layer of the peritoneum was stitched with a continuous catgut suture, and the abdominal wound closed in the usual way without sutures. The symptoms of pyloric obstruction were clearly due to the pressure of the tumour upon the duodenum. This pressure would be accentuated by reason of the position of the superior mesenteric artery across the front of the sac.

Fig. 2.—Case II. Horseshoe kidney, showing the kidneys united by a transverse band containing the cyst. *u u*, ureters. The dotted lines indicate the position of the incisions for removal of the cyst.

After-History.—The patient made a slow convalescence owing to the severity of an attack of pleurisy with effusion, beginning about fourteen days after the operation, probably tuberculous in character.

Report upon the Cyst and Contents by Dr. M. Smith, Pathological Curator, Leeds General Infirmary.

The cyst wall is composed mainly of fibrous tissue. In its substance can be seen traces of renal tissue. The glomerular tufts in some places are represented by small masses of fibrous tissue, in others by delicate connective tissue, the spaces of which are filled by a homogeneous material. The efferent, afferent, and straight vessels are impervious, and

Fig. 3.—Case II. Cyst removed from horseshoe kidney. On the right the kidney tissue is clearly seen. On the left it is shown as a narrow dark band.

have undergone complete fibrous transformation. The nuclei of the cells lining the uriniferous tubules at places remain. The reaction of the fluid is faintly acid; the colour is pale; albumen is absent; urea is present in the proportion of 0.5 per cent.; chlorides, sulphates, and phosphates are present; sugar is absent. Microscopically the slight deposit shows quantities of earthy phosphates and amorphous urates. The cyst is unilocular, about the size of a tangerine orange, is of 30 c.cm. fluid capacity; it is growing from the kidney substance.

Solitary cysts of the kidney are infrequent. A. von Brackel was able to collect the notes of only 22 cases, recorded between 1865 and 1899. The cysts occurred between the ages of 18 and 64, they developed generally in the cortex of the kidney, and

were situated at the upper or lower pole, more commonly the latter. By all authors the sharp limitation of the cyst from the kidney substance is considered characteristic. The contents are clear, thin, pale yellow fluid, containing albumen and a large proportion of salts, and rarely urea. Of the 22 cases, 14 were females, 6 males, and in 2 no mention of sex is made. The cysts may be retention cysts, or possibly cystic developments in "rests" derived from the Wolffian or Müllerian ducts. The former explanation would seem the more likely.

Partial nephrectomy for cyst of the kidney has been performed by Kümmell, Bardenheuer, Zöge von Manteuffel, and Henry Morris. Kümmell's case was one of hydatid cyst. In Bardenheuer's case septic infection of the wound and kidney necessitated a complete nephrectomy five days after the first operation. All the patients recovered.

CASE III.—Myxo-sarcoma of the Lower Pole of the Right Kidney: Excision of Half the Kidney.

Miss D., aged 21 years. Seen in consultation with Dr. Carlton Oldfield.

History.—She first consulted her medical man on August 30th, 1901, complaining of pain in the right side of the abdomen. She looked thin and ill, and was profoundly anaemic. The abdomen was examined and a tumour discovered. A careful examination into the history of the patient showed that there had been no frequency of micturition, no pain during, before, or after micturition. No alteration had been observed in the character of the urine. Pain in the body was the only complaint; it had begun slightly about a month previously; during the month a few pounds in weight had been lost. The patient was sent to bed and kept under frequent observation. The temperature was above normal on every occasion, varying from 100° to 101° in the morning, and from 102° to 103.5° in the evening. About 1½ pint of urine was passed in twenty-four hours. The urine was frequently examined, and nothing abnormal was ever discovered in it.

Fig. 4.—Case III. Myxosarcoma of kidney. The lower half of the kidney removed. The kidney has been split and opened. The hook by which it was suspended for the purpose of photography is in the line of cleavage. Healthy kidney is seen above the disease. The resemblance to tuberculous disease is apparent even in the photograph.

Condition on Examination.—A large, rounded, smooth mass, equal in size, as it seemed, to a cocoanut, was found. There was a limited range of movement on respiration. Renal ballotement was unmistakable. The abdomen elsewhere was normal. An area of resonance surrounded the tumour, and the fingers could be dipped in between it and the liver.

Operation.—The usual lumbar incision, subsequently prolonged into the lumbo-ilio-abdominal incision, was made, the kidney exposed, and an attempt made to strip it in order to deliver it through the wound. It was then found that the

tumour was very much smaller in size than had been anticipated—a not unusual experience in renal surgery. The kidney stripped readily in its upper half, the lower half to which the enlargement was confined, was stripped with the greatest difficulty, and then incompletely. The incision at this stage was enlarged, and the kidney, with much thickened capsule adherent at its lower border, was delivered. The condition was then found to be as follows: The upper half of the kidney was healthy in appearance and supple;

Fig. 5.—Case III. *a*, line of incision for removal of cyst. *b*, line of incision for removal of tuberculous disease. *c*, ligature applied to branch of renal artery.

the lower half was enlarged, tough with thickened capsule, but in places soft and friable, and beads of pus oozed out here and there. The pelvis of the kidney was healthy, and the ureter, which was subsequently dissected clean for 4 inches, was normal. It was clear that the disease, being limited to half the kidney, might be removed and the upper healthy portion of the organ left. The renal vessels were then grasped by the fingers of an assistant and I made two incisions, the first from before backwards and upwards, the other from behind forwards and upwards into the kidney well beyond the disease. The incisions met in the centre of the kidney and enclosed a wedge of renal substance, above the disease, between them. The severed surfaces of the kidney were healthy. At the inner part of these incisions a small portion of the pelvis was removed with the lower end of the kidney. Through this opening a large probe explored and demonstrated the patency of the ureter. A branch of the renal artery and a large tributary of the renal vein were ligatured. A continuous Lembert stitch was then made to unite the cut edges of the pelvis and was continued on into the kidney substance so that, when the kidney wound was stitched up, a portion of this suture was buried. The edges of the kidney incision were then brought together by stout catgut interrupted sutures introduced with a large curved intestinal needle at intervals of about half an inch. On relaxing the pressure upon the renal vessels the wound remained dry. Some thickened masses of tissue, the result of a chronic sclerosing perinephritis, were carefully dissected out, the most tiresome dissection being carried out upon and around the vena cava. The kidney remnant was replaced, the incision in the parietes stitched up in tiers, and a drain of gauze left hanging from the posterior end of the wound. A photograph of the resected portion of the kidney (without the thickened capsule which was also removed) is reproduced (Fig. 6). It shows quite clearly the localised deposits and the healthy margin of kidney tissue.

After-History.—The patient recovered slowly from the operation. She is now (January, 1902) quite well. The urine is normal and the wound soundly healed.

Report upon the Specimen by Dr. W. M. Smith.

In the cortex is a growth about an inch long and half an inch in breadth at its widest part. It is of a pale colour. In its substance are a number of yellowish points. Throughout the other parts of the cortex, also are small deposits of this yellow material. The growths are not bounded by any zone of fibrous tissue, but at their periphery is a line of

intense hyperaemia. The external surface of the cortex is very vascular. The capsule of the kidney is very thick, and contains a large amount of fat. Under the microscope the growth consists of elongated and rounded faintly staining cells. They have numerous long slender processes, which form a felt network which extends throughout the whole kidney substance. This is apparently causing atrophy of the normal kidney

Fig. 6.—Showing the wedge removed from a kidney, and the interrupted catgut sutures.

structure. In the substance of the growth are numerous small vessels with very thin walls. There is a great infiltration of multinucleated leucocytes into the tumour, which at places almost obscure the tumour growth. The periphery of the cortex shows great haemorrhages, but in it can be seen the tumour cells. The growth appears to be of the nature of a myxosarcoma which is undergoing inflammatory change. To the naked eye the growth resembles very closely a localised tuberculous deposit undergoing caseation; this was the diagnosis made at the time of the operation. The treatment was based upon the diagnosis.

RECURRENT CARCINOMA TREATED BY THE ROENTGEN RAYS.

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THE salutary influence of the Roentgen rays on cancer is quite remarkable, and to judge from what I have already seen I will venture to predict that the day is not far distant when their use for diagnosis will be a small matter in comparison with their employment for the relief and arrest of cancerous and allied growths and ulcerations.

A few months ago a lady consulted me for a recurrent scirrhus growth, of the size of a hen's egg, on the manubrium of the sternum. The growth was fixed, and apparently growing from the bone. Below it was a hardened ulcerated surface about two inches square. Her left arm was greatly swelled, and extensive deposits could be felt in the axilla. She had been operated on for scirrhus mammae three years previously by an eminent Liverpool surgeon, who also saw the recurrence, but refused to attempt any further operation. Notwithstanding her entreaty, my advice was the same, as was also that of a well-known Birmingham surgeon, whom she also consulted.

After a good deal of palliative treatment, which I need not specify, and as she was steadily getting worse, I advised the use of the Roentgen rays. These were employed at the Cheltenham Hospital for twenty minutes on as many days. The treatment was somewhat pressed as she was obliged to leave Cheltenham a few weeks after its inception. After an absence of a month she has now returned in excellent health and spirits, for the sternal growth has completely disappeared, the ulcerated surface has healed, and her pain, which was considerable, has greatly lessened, being now confined to the arm alone, the swelling of which has much diminished.