ON A CASE
OF
SUPPRESSION OF URINE,
FOLLOWING INJURY TO A SACCULATED KIDNEY
CONTAINING CALCULI, THE OTHER KIDNEY
BEING ENTIRELY DISORGANISED.

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SAMUEL C—, æt. 13, first came under my observation at the East London Hospital for Children, in February, 1886, on account of hæmaturia, which followed immediately on a fall over some steps. We were led to suppose that his health had always been good before the accident. The boy was well-nourished and strong and met with his accident while playing at school.

On January 21st he fell over some steps, striking his right side in the region of the kidney; he lay in the school-yard for some time in great pain, and had difficulty in getting home; he was then put to bed. Two days later "he passed blood instead of urine," as his mother expressed it. For a week he vomited every day, and passed bloody

urine, and suffered more or less pain, after which he gradually regained his previous health.

On February 2nd, *i. e.* about fourteen days later, the pain and bloody urine returned, and he was then brought to the hospital. The day after his admission it was noted that he had complained of pain in his side but had not vomited. Careful palpation, which did not appear to cause pain, failed to detect any local abnormality. The urine was pale in colour, sp. gr. 1005, faintly acid, free from deposit and from albumen. He remained in the hospital about three weeks, but beyond the slight pain and some little hæmaturia for a day or two, there were no symptoms to point to injury or disease of the kidney, and he was accordingly discharged. His temperature was raised for the first few days to about 100° F., but subsequently went down, and continued normal. Nothing more was heard of him until the end of April, when he was brought back and readmitted.

It was then stated that he had been very variable since his discharge, sometimes being apparently well, at others complaining of severe pain in the side, and vomiting; for the last five days there had been pain in both sides, and he had vomited and had had shivering fits occasionally. On further questioning, the mother stated that he had had symptoms of this kind for twelve months previous to his accident but that they had got worse since. His urine had not contained any blood previous to the accident.

On readmission (April 27th) he was found to have a prominent swelling, occupying the space between the costal arch and the crest of the ilium, reaching forward as far as the mid-line of the body, and backwards, nearly to the spine; it was smooth on the surface, tense, with obscure fluctuation, dull on percussion and sharply defined at the front margin. The boy complained of pain and some tenderness over the whole swelling, back and front. The first urine passed was dark in colour from the presence of blood. The temperature was normal. He was kept in bed; the urine continued to contain blood until April

30th, when it was found to be considerably less dark in colour.

After consultation with my colleague, Dr. Eustace Smith, the swelling in the loin being more tense and painful, I decided on tapping it, and I drew off fifty-five ounces of clear amber-coloured urine; this was found to contain a considerable amount of albumen; under the microscope plenty of blood-corpuscles were found, but no casts, and no crystals of any kind. The temperature rose slightly after this operation (101° F.) but fell again the next day.

May 3rd.—The urine has averaged forty-five and a half ounces per diem since his admission, but the quantity has gradually become smaller. On April 28th fifty-six ounces were passed; on May 2nd only thirty-four ounces; it has been lighter in colour (that is, freer from blood) since the tapping. During the last twenty-four hours only five ounces have been passed; this was pale in colour, alkaline in reaction, and contained albumen; there were no casts, but an abundance of blood-corpuscles, and a few crystals of phosphates. He is free from pain; the cyst is again gradually filling.

4th.—Ten ounces of urine passed during last twenty-four hours.

5th.—Eighteen ounces of urine passed.

6th.—Urine, twenty ounces.

7th.—Urine, one ounce in the twenty-four hours. The swelling was now as large as, or larger than, at first; its anterior margin reached well beyond the mid-line of the abdomen; its size and tension caused considerable distress. A fine capillary cannula was introduced, and fluid, to the amount of seventy-four ounces, slowly drained away.

8th.—The tumour had again filled up, and was again tapped. Towards night the boy became very restless, and complained of great pain in the abdomen. Hot fomentations were applied and afforded some relief.

9th.—I found the boy very ill; he had been very restless, and at times delirious, through the night, and was

now evidently suffering from uræmia. A vapour bath was ordered, which caused the patient to sweat very profusely ; while this was going on, he became convulsed on the left side. Not more than two ounces of urine had been voided during the past thirty-six hours.

The convulsive attacks continuing, and having obtained the consent of the parents, I proceeded to cut down upon the kidney. Chloroform was carefully administered by Dr. Richards, one of the resident officers ; as anæsthesia came on the convulsive movements gradually ceased, and the breathing became regular. Mr. Battams, resident medical officer, assisted me at the operation. An incision three inches long, slightly oblique from above downwards and forwards, was made just below the twelfth rib down to the perirenal fat ; this was caught up with two pairs of dissecting forceps and separated sufficiently to admit a finger, with the further aid of which a sufficient area of the kidney, or rather of the peri-nephritic sac, was exposed. A small cannula was introduced and a quantity of the fluid let out. After the tension of the sac had been relieved an opening was made with a scalpel sufficiently large to admit three fingers. Between eighty and ninety ounces of fluid were evacuated ; it was of a dark port wine colour with a faint urinous smell ; it contained several blood-clots (small) which from their dark colour appeared to be recent.

The interior surface of the sac-wall was smooth and velvety, and there existed in different places a few firm adhesions between it and other parts of the cyst cavity. This sac extended far beyond the reach of the finger, downwards and forwards towards the pelvis, and in front beyond the umbilicus. The exact nature of the sac was not made out at the time ; it appeared to be connected with the external border and adjoining parts of the anterior and posterior surfaces of the kidney. At its attachment to the kidney the sac was small and narrow, but towards its apex it broadened out and was very extensive, not unlike an immense pear. The narrowness of the attached part of the sac, and the strength and thickness of the walls,

quite prevented exploration, by the finger, of the anterior and posterior surfaces of the kidney and of its pelvis and ureter. The kidney itself was of a livid colour and studded here and there with small cysts. As there appeared to be some fluctuation, and with a view to examine for calculus, I passed in a long needle in several places without, however, striking a calculus. As urine dribbled out of these punctures I subsequently introduced a fine cannula and let out about six ounces of blood-stained urine. After the sac had been evacuated its edges were sewn to the margin of the wound; a suitable drainage-tube was put in, it being deemed inexpedient to proceed further at the time.

My colleague, Dr. Dawson Williams, was kind enough to examine the fluid for me. He reported a sp. gr. 1012 with neutral reaction, and that 100 cc. yielded 1.95 grammes of albumen, and that the filtrate gave on two estimations .7 and .6 per cent. of urea, an average of .65 per cent. The proportion of blood was probably 6 or 7 per cent., assuming all the albumen to have been due to blood.

May 10th.—The boy passed a quiet night, sleeping for several hours. There was no return of the convulsions. On seeing him in the early afternoon I was disappointed to find the dressings quite dry and the sac quite empty. He had voided no urine; a catheter was passed into the bladder and about 3ss of blood-stained urine was drawn off. Under the circumstances I considered further operative interference contra-indicated. After consultation with Dr. Crocker a wet pack was ordered for an hour, small doses of elaterium were to be given internally and a poultice of digitalis leaves was applied over the region of the kidneys.

May 13th.—The boy died. Between this and the preceding date not more than three ounces of urine were passed. No fluid escaped from the opening in the loin.

Autopsy.—Only a partial autopsy was permitted. The two kidneys, ureters, and bladder were removed together. Connected with the external border of the right kidney was a sac which reached downwards to the brim of the

pelvis, and forwards almost to the mid-line of the abdomen. Between this sac, near its pedicle and the abdominal wall there were some recent adhesions. The sac was completely empty; its interior was shreddy, and dark in colour from blood staining. No direct communication between it and the pelvis of the kidney could be found. It is thus not easy to explain how the urine found its way into the sac. The wall of the sac appeared to be quite independent of the normal capsule, for this latter, though somewhat thickened, peeled off with ease; the sac wall was about a quarter of an inch in thickness, fibroid in appearance, well organised, and therefore of some standing.

The kidney was about twice its normal size, pale and mottled in appearance, with some small cysts on its surface. When cut into it was found to be undergoing cystic degeneration; the calyces were much dilated and thickened; in one of these a calculus, as large as a broad bean, was found. The pelvis of this kidney was also dilated, and the ureter as low down as the brim of the pelvis was thickened and dilated so as to readily admit the little finger. At the level of the brim of the pelvis a small calculus was found in it; beyond this point the ureter was of normal size.

The left kidney was degenerated into mere sacculations, several of which contained small calculi. One of these sacculations contained a calculus similar to, but rather smaller than, that found in the right kidney. The ureter was slightly larger than normal. The bladder was healthy.

As far as could be seen, the other viscera appeared quite normal, but we were not allowed to remove them.

Remarks.—(1) *Diagnosis.*—When the boy first came under observation, a diagnosis was made of rather severe bruising of the right kidney, with consequent hæmaturia. When he came under observation for the second time, with the additional history that was elicited of his condition previous to the accident, and with more or less continuous symptoms of localised pain, vomiting, and intermittent hæmaturia since his discharge from the hospital, a diagnosis

was less easy. Moreover, his symptoms had been greatly aggravated for five days previous to readmission, and besides this, a soft fluctuating swelling had developed in the region of the injury. On the whole, the diagnosis became injury to the kidney with subsequent development of hydronephrosis. But the comparatively late onset (upwards of three months after the accident) of the adventitious sac pointed, I thought, to some further condition, and this was suspected to be a calculus, which had been displaced at the time of the accident, and was now interfering with the outflow of urine from the pelvis of the kidney, possibly in consequence of inflammation set up around its new site. This view was thought to be strengthened by the continued presence of blood in the urine.

(2) *Symptoms*.—An examination of the amounts of urine passed in periods of twenty-four hours is interesting :

In the first period of 24 hours, 56 oz., blood stained.

In the second ,, ,, 56 oz., ,, ,,

In the third ,, ,, 40 oz., less ,, ,,

In the fourth ,, ,, 43 oz., again clearer. .

In the fifth ,, ,, 34 oz., ,, ,,

An average of $45\frac{1}{5}$ oz. per diem.

During the next two periods the amount fell to five ounces and ten ounces respectively, while in the next two periods the amount rose to eighteen ounces and twenty ounces respectively, an average of only thirteen and a quarter ounces per diem. In the next period of twenty-four hours, only one ounce of urine was passed, but it was not until two days later that I recognised that suppression of urine had come on. The nephrotic sac had refilled each time after tapping so rapidly that I concluded all urine from the one kidney passed into it, and that the small quantity voided *per urethram* represented the product of the other kidney, and I further thought it not impossible that owing to pressure on its ureter or pelvis, the outflow was interfered with, for at this time there was nothing to lead me to suspect disease of the left kidney. On May 9th, however, I found unmistakable symptoms of uræmia,—somno-

lence, offensive breath, and convulsions, and that not more than two ounces of urine had been passed in two days.

(3) *Treatment*.—Under the circumstances, which was the best treatment to pursue? The diagnosis was far from clear. Had I to deal with a case of complete suppression of urine, brought about by the pressure of a hydronephrosis on the renal nervous ganglia? Had I a case of solitary kidney, and that diseased? or had I to do with double calculous disease with symptoms chiefly confined to one side? To discuss these questions with all the details of the case complete, and with the notes of the post-mortem examination before us, would serve no useful purpose. A more interesting issue appears to me to be whether, even with full knowledge of all the details, I could have dealt successfully with the case.

This opens up the question whether the small calculus impacted in the ureter could possibly have been removed through an opening in the loin, and whether, therefore, an intra-abdominal operation would not have been better. The latter would have permitted me to discover the disorganised condition of the left kidney; also the calculus in the right ureter just at the brim of the pelvis, and possibly to push this calculus back through the enlarged ureter into the pelvis of the kidney. I might also have dealt more successfully with the right kidney, after incising it, had I opened the abdomen, and had eyes as well as fingers to assist me. Finally, it would have demonstrated the absolute infeasibility of removing the right kidney, it being practically a solitary one, a proceeding I might otherwise have contemplated, and which, I think, would have been surgically indicated, in a case where there was an obstruction, more or less complete, in its ureter, which could not be removed.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 232.)