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# CONGENITAL RENAL AND URETERAL ANOMALY.

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# CONGENITAL RENAL AND URETERAL ANOMALY.*

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The anomaly to be described was found at the necropsy of a boy, aged 12 years, who died on November the 8th, 1912, from generalised paralysis following very severe faucial and nasal diphtheria on the forty-seventh day of disease.

The amount of urine passed during the first eighteen days ranged from 21 oz. to 37 oz. in the twenty-four hours. Albumin was present in the urine from the third to the thirty-eighth day.

The necropsy, which was held on the day after death, showed hypostatic congestion of both lungs, thickening of the left ventricle and dilatation of the right ventricle. Examination of the abdominal cavity showed that the right kidney was absent, together with the corresponding renal artery and vein and suprarenal. The right ureter, however, was present, and extended upwards from the bladder to the mid-lumbar region, where it ended blindly. It measured 5 in. in length. The left kidney was situated in the usual position and was considerably enlarged, being $4\frac{3}{4}$ in. long, 2 in. broad, $1\frac{1}{2}$ in. thick, and 6 oz. in weight—practically the measurements of the adult organ. There was partial duplication of the ureter, the upper branch, 4 in. long, supplying the upper third, and the lower branch, $3\frac{1}{2}$ in. long, supplying the lower two thirds of the kidney. The branches united 3 in. from the bladder at the brim of the pelvis. On opening the bladder the right and left ureteral orifices were seen to be of the same size. The patency of the right ureter was proved by the readiness with which a platinum culture needle could be passed from the vesical orifice to the blind upper extremity.

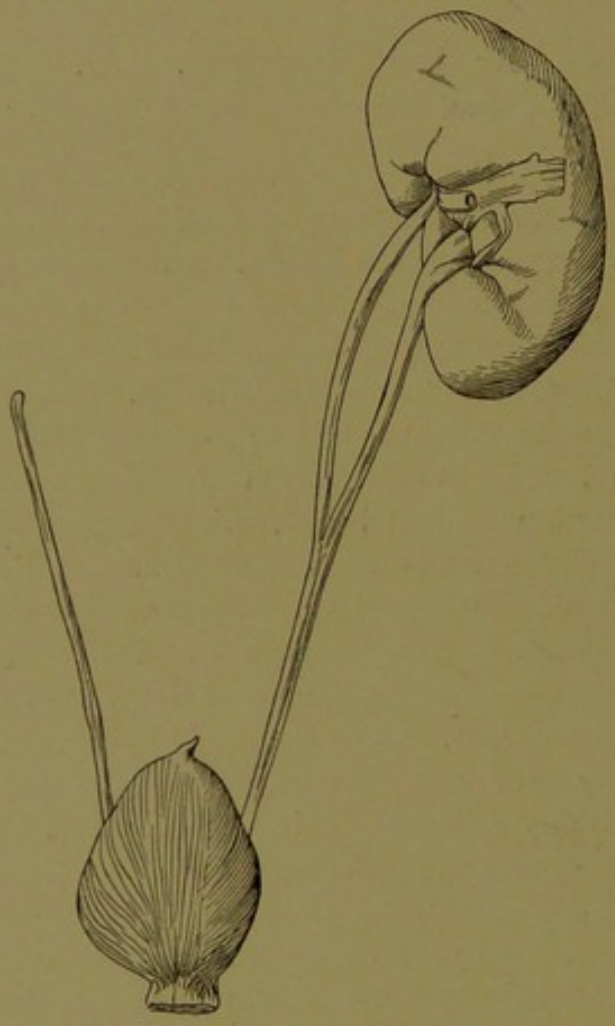
There were no congenital abnormalities of the genital, circulatory or other systems.

It is a well-known fact that there are no symptoms peculiar to

* Specimens of the cases were shown at the Children's Section of the Royal Society of Medicine on January the 24th, 1913, and are now in the Museum of the Royal College of Surgeons.

single kidney, which in this case, as in most of those on record, was a necropsy surprise.

The abundant and persistent albuminuria was such as is usually found in malignant diphtheria. The amount of urine was meaured during the first three weeks of the disease, merely to serve as a guide to prognosis, a marked diminution in the urine during the acute stage of diphtheria being of bad omen. There was no oliguria



Renal and ureteral anomaly. (From a drawing by M. E. Waring.)

in the present case, the single kidney being perfectly able to do the work of two.

Whether the violent attacks of abdominal pain were associated with the abnormal condition of the kidney or ureter I am unable to say. There was no evidence, however, of any calculus, to which single kidney seems to be unusually predisposed (Morris).

It is interesting to note that the blood-pressure, which had fallen from 100 mm. on the third day of disease to 80 mm. on the ninth, rose with the onset of late paralysis to 110 mm. on the thirty-seventh

day, and on the day before death to 120 mm. and 130 mm. This rise of blood-pressure was probably not connected with the renal condition, but was such as often occurs in late diphtheritic paralysis, and was possibly due, as I have suggested elsewhere, to an irritative condition of the vaso-motor centres in the medulla, in which the other nerves have undergone a varying degree of paralysis.

The case is one of unusual interest from the anatomical, medical and surgical standpoints. As far as I have been able to ascertain from a study of the literature, no other cases have been recorded of asymmetrical kidney with partial duplication of its ureter co-existing with a patent ureter on the side on which the kidney is absent. The condition of single or asymmetrical kidney is by no means common, being found, acccording to Morris, in only one out of 2400 autopsies; 213 were collected from literature by Ballowitz in 1895, 286 by Anders in 1910, and 300 by Dorland in 1911. Probably these figures are too large, some of the cases, especially those recorded by the earlier writers, being examples of fused and not of single kidney.

The congenital absence of the kidney is due to failure of the Wolffian duct to throw off the corresponding renal bud after the duct has reached the cloaca.

Duplication of the ureter, which is usually incomplete, as in my case, is not so very uncommon, being found in 1 to 2 per cent. of all corpses (Lessing). The association of single kidney with complete or partial duplication of the ureter, though uncommon, is not unique, cases having been recorded by Morgagni, Blaise, Rufz, Laroche and Gérard. The last authority regards the association of double ureter with single kidney as a pure coincidence. The presence of a ureter on the side on which the kidney is absent is very exceptional. Out of 286 cases of single kidney collected by Anders, there were only 24 in which a more or less rudimentary ureter was present on the side on which the kidney was absent. In the majority of these the ureter was impervious, and I have been able to find only six other cases besides my own in which the ureter was patent throughout its entire length (Haberer, Hallopeau, Horand, Nelson, Paulicki, Winter).

The medical interest of single kidney lies in the frequency with which the organ is liable to disease. According to Anders, 79 out of a total of 170 cases or 46·5 per cent. in which renal lesions were recorded showed morbid changes, and 42·3 per cent. some form of chronic nephritis. The outlook in these cases is less hopeful than when both kidneys are present.

The surgical importance of single kidney is impossible to over-estimate. The present case shows how important it is before operating on the kidney to ascertain not only whether there are two ureteral orifices but also whether urine escapes from both—in other words, not only is cystoscopy necessary, but also catheterisation of the ureters. The partial duplication of the ureter adds a further difficulty. In catheterisation of the kidney collection of urine from the upper or lower branch respectively would give an erroneous idea as to the functional value of the organ. At present no instrument has been invented to detect this anomaly (Jeanney). In Mauclaire and Séjournet's case the upper two-thirds was served by one ureter and the lower one-third by the other, while in Jeanney's case, as in my own, the upper one-third of the kidney was supplied by the upper branch, and the lower two-thirds by the lower branch of the double ureter.

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