

HYDRONEPHROSIS IN THE DOMESTICATED ANIMALS.

By GERALD LEIGHTON, M.D., F.R.S.E. (Interim Professor of Pathology and Bacteriology, Royal (Dick) Veterinary College, Edinburgh).

IN a former number of the *Journal of Comparative Pathology and Therapeutics* I described a case of hydronephrosis in a collie dog associated with congenital absence of the other kidney. During the past year two further cases of this condition have come under my notice, one in a pig and the other in a cow, and it may prove of interest briefly to describe these, adding some remarks which the series of three cases suggest.

In the case in the pig the hydronephrosis was double, and the condition of the kidneys is well shown in the photograph here reproduced

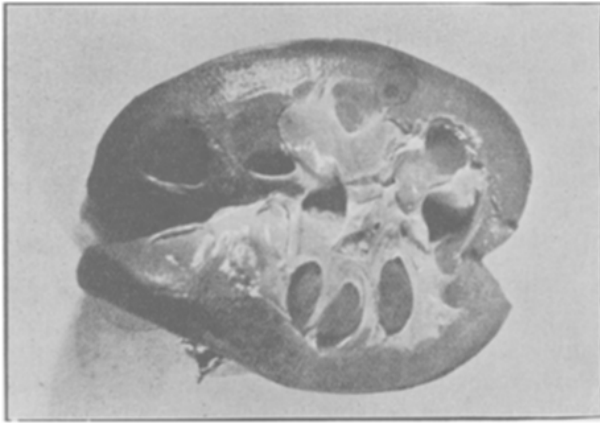


FIG. 1.

Hydronephrosis of pig's kidney.

(fig. 1) of one of them, the other being precisely similar. The pelvis is much dilated, the whole of the kidney being converted into a multilocular cyst, surrounded by the atrophied cortex. The ureters were very greatly thickened, but the thickening was extremely irregular. In the right ureter, about half-way between the kidney and the opening of the ureter into the bladder, the lumen was entirely occluded by great fibrous thickening of the ureter walls. Nearer the opening into the bladder the walls were considerably thinner. The whole length of the ureter was marked by tortuosities, and here and there by pouching. The fact that the hydronephrosis was double indicated that the origin of the condition would be found in all probability in the bladder, and examination of that organ proved this to be the case. The bladder itself, on coming into my hands, was distended, and when opened was found to contain a large quantity of thick purulent fluid, obviously septic. The mucous membrane was thrown into numbers of thick folds, on which was a deposit of purulent matter which washed off with some difficulty, leaving a bare roughened wall be-

neath. But the most remarkable point in the bladder was the great thickening of its walls. Anteriorly and inferiorly the thickening of the wall was very marked, reaching as much as one-third of an inch in the distended condition. Superiorly the thickening was also obvious but not so great. Immediately round the point of junction of the urachus and bladder wall the thickening reached nearly half an inch, diminishing from that point in concentric fibrous laminae.

The condition, then, was that of a chronic septic cystitis, which had gradually spread upwards along the two ureters, causing a chronic inflammatory thickening of these as it went on, and ultimately reaching the pelvis of the kidney. Gradually the pressure exerted by the obstruction to the outflow of urine began to act upon the kidney pelvis, but the animal was slaughtered before complete atrophy of the cortex had taken place.

A condition of dilatation of the pelvis of the kidney with suppuration added is spoken of as pyonephrosis; but in this case there did not seem to be actual suppuration in the pelvis itself, which contained turbid, but not purulent, fluid. I retain, therefore, the term hydronephrosis for descriptive purposes.

It so happens that, of three cases I have examined—one each in the dog, pig, and cow—this one in the pig was the only one in which I had the opportunity of examining the bladder also. But in this particular case the bilateral nature of the hydronephrosis would have been sufficient to locate with fair probability the seat of the cause, even had the ocular demonstration not been forthcoming in the state of the bladder.

The causes of the condition may conveniently be divided into two groups: (1) those situated above the point of entrance of the ureters into the bladder; and (2) those situated below that point, either in the bladder or urethra. To these may be added a third less common group caused by pressure exerted from without upon some part of the urinary tract.

The various causes which may be responsible for unilateral or bilateral hydronephrosis may be enumerated as follows:—

Unilateral Causes.—Causes of obstruction to the outflow of urine situated above the point of entrance of the ureter into the bladder will produce a unilateral hydronephrosis of the kidney of that side. Such are: deformity of ureter, occlusion, contraction, twist, kink, calculus impacted, pressure of pelvic tumour, pelvic scar tissue, uterine displacements, pregnancy.

Bilaterally Acting Causes.—Causes of obstruction below the points of entrance of the ureters into the bladder will produce a bilateral hydronephrosis. Such are: any vesical or urethral obstruction, usually incomplete; calculus in bladder or urethra; enlarged prostate; pressure of tumour; stricture; chronic cystitis.

N.B.—Bilateral hydronephrosis may, in rare instances, be caused by a similar condition in both ureters—*e.g.*, a calculus in each. In a large proportion of hydronephrosis there is some congenital defect present.

The third case of hydronephrosis to which I wish to refer occurred in a cow, and was remarkable for the degree to which the kidney

tissue had atrophied, and the immense size of the cyst into which the kidney had been converted. The contents in this case were clear fluid, and measured several gallons. The case was undiagnosed in life, the specimen coming to me from the slaughter-house. For the photograph (fig. 2), which illustrates it better than mere description, I am indebted to Mr Linton.

There was no history obtainable in this case, but the enormous distension of the kidney and the amount of the cystic contents, together with the fact that the other kidney was in a normal condition, all point to the conclusion that the case was one of sudden onset and great acuteness. In all probability it was associated with a kink in

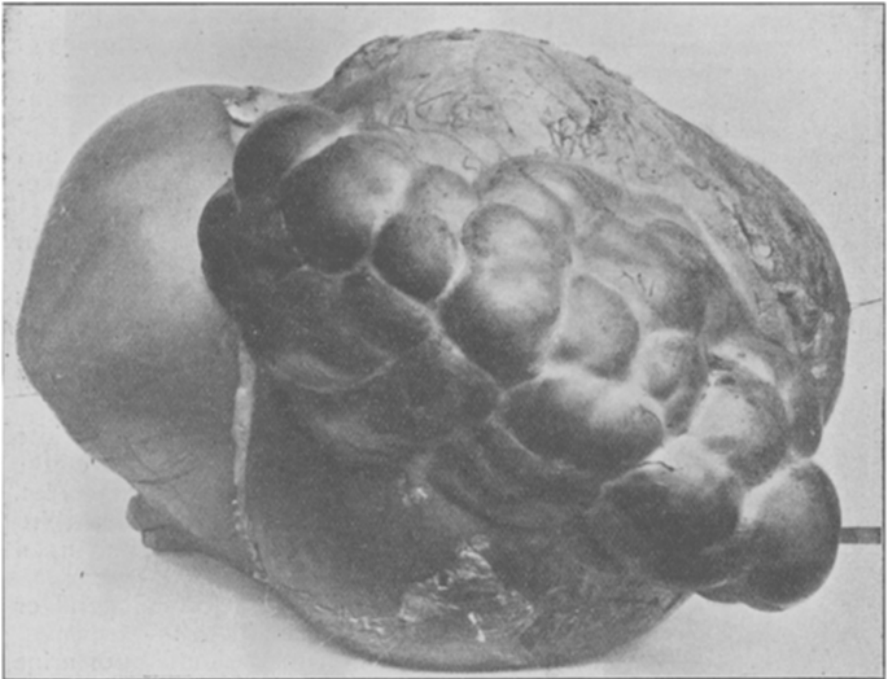


FIG. 2.

Hydronephrosis of cow's kidney.

the ureter of that side, and it is regrettable that one could not have had the opportunity of examining the whole urinary tract. Although there is an appearance of kidney still to be seen in the photograph, the resemblance is only superficial. There was no kidney tissue left, nothing but the exaggerated outline. It seems strange that the presence of such an immense swelling, fluctuating as it must have been, should not have been observed, but the thickness of the skin and the strength of the abdominal walls in cattle prevent the tumour becoming as palpable as would be the case in a corresponding condition in a human being. Moreover, pain is often absent and even tenderness but little marked, while hæmaturia is rare and the urine (from the other kidney) normal.

I have already referred to the etiology of this condition in the case of the pig previously described, and the only further point that one would like to raise is this: Is hydronephrosis so rare in domestic animals as we are apt to think? At any rate, here is the fact that there have passed through the hands of one observer cases in three different species (dog, pig, and cow) within a comparatively short period. That may, of course, be a mere coincidence, but, on the other hand, it may point to the condition being more common than is supposed. The absence of pain, or obvious swelling, or urinary symptoms also suggests that many cases escape observation during life. It would be of interest to have the experience of inspectors and slaughterers upon the matter.

THE PATHOLOGY OF CANKER: A CONTAGIOUS DISEASE OF SERPENTS.

By the Same.

ALL those who have ever had charge of serpents in captivity, whether in menageries or in private cages, are well aware of the existence of a peculiar form of disease which attacks these reptiles. It is extremely infective and almost invariably fatal. Amongst reptile keepers the condition is known as *Canker*. It is one of the very few diseases of cold-blooded vertebrates which are known to be infectious, and, for that reason, presents an interesting study. As a matter of fact, serpents are curiously immune to most infections, as well as to some forms of toxin, but to this particular disease they are extremely susceptible. Its clinical appearances do not present any obvious analogy to any other disease, though in its general course the condition somewhat resembles tuberculosis.

Symptoms.—The parts affected are those of the head; and especially the mouth, lips, and eyes. Frequently the first sign is an opacity of the eye, which gradually turns quite white, though there are many cases in which the eye escapes altogether. Gradually the head enlarges, and a close examination will reveal the fact that the swelling is due to a gradual growth of tissue in connection with either the lower or upper jaw. As this progresses it becomes more and more difficult for the reptile to feed, and in time quite impossible. The growth enlarges until the whole mouth cavity may be quite filled, the head then presenting a peculiarly distorted appearance. The skin is naturally stretched to such an extent that the scales are individually separated. Outwardly there is no sign of any other part of the body being affected, and in this condition the reptile may linger for a considerable time, varying from two or three weeks to as many months. The disease attacks the majority of species which are kept in captivity, especially the smaller kinds, as the following typical cases indicate:—

Case I.—A common ring snake was purchased from a dealer, and a day or two after arrival one of its eyes was noticed to be cloudy. This became more and more opaque, and finally of a dirty white colour