ON A CASE
OF
INTERMITTING HYDRONEPHROSIS;
WITH
SOME REMARKS ON HYDRONEPHROSIS AS A CAUSE
OF ABDOMINAL TUMOURS.

BY
HENRY MORRIS, M.A., M.B. LOND., F.R.C.S.,
SENIOR ASSISTANT SURGEON TO, AND LECTURER ON ANATOMY AT, THE
MIDDLESEX HOSPITAL.

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It is long since a special name was used to signify distension of the pelvis of the kidney, or pelvis and ureter, by retained urine. Martineau in 1785 called it "Hydrops Renis," and James Johnson in 1816 suggested "Hydro-renal-distension." In a recent volume (twenty-third) of the Pathological Society's 'Transactions' the indefinite name "cystic tumour of the kidney" is used and defended; but since the publication of the 'Traité des Maladies des Reins' in 1841, the term "Hydronephrosis" then introduced by Rayer has been very generally employed.

A word of explanation is, however, requisite concerning the prefix I have ventured to apply to Rayer's term in the heading of this paper, because the name "intermitting hydronephrosis" is not to be found in any

medical writings, so far as I am aware, except in a recent communication to the 'British Medical Journal' by Dr. Cole, of Bath. By it I mean a tumour caused by dilatation of the pelvis of the kidney, and it may be of more or less of the ureter, which disappears altogether for a time, to appear again and again at intervals. It is used only in a clinical sense, and even thus is not meant to be applied to cases in which the tumour varies only slightly from time to time—varies, that is to say, to such a degree only as may be due to the changes in the abdominal contents by the ingestion of food or irregularity of the bowels.

Pathologically, no doubt, the amount of distension in most cases of hydronephrosis is subject to variations; and in some, probably, such as where the dilatation is the result of pregnancy or carcinoma uteri, the pelvis of the kidney occasionally quite empties itself; but it would be incorrect to speak of any tumour or swelling which is not capable of clinical examination as *intermitting*, since any changes in size could not possibly be detected with certainty, and could only be inferred with hesitation.

The following case came under my care in the Middlesex Hospital in the autumn of 1874:

Jane G—, of Henry Street, Hampstead Road, æt. 56, a married woman who had had no children, was admitted into Regent Ward, on August 5th, 1874.

History.—Six years ago she began to suffer pain in the abdomen, especially about the bladder, and to pass blood in the urine which she voided with great difficulty. She was very ill for a time, and was told by her doctor that she suffered from inflammation of the bladder. She never thoroughly recovered, and up to two years ago continued to pass blood at intervals and in varying quantity with her urine.

In February, 1874, she was again very ill, and was confined to her bed for some weeks. She did not at this time void blood with the urine. Since February she had been gradually losing strength.

In March she applied for relief at the out-patient department of the Samaritan Free Hospital, but attended only for a very short time. After an interval of four months she returned to that institution on July 2nd, and was treated for cystitis up to the 23rd of the same month. At both these periods the symptom she mostly complained of was inability to hold her urine.

On admission into the Middlesex Hospital it was noted that she was a thin, bony-framed woman, with a pinched and distressed look about her face. She complained of pain of a "bearing-down" description in the urethra and vagina after micturition, but had no difficulty in passing urine. She stated that blood came away in her water, but thought that more flowed after than with it.

Stone or some vesical growth was suspected, and it was accordingly proposed to sound her, but on examining *per vaginam* a small, soft, vascular, papillary tumour about the size of a pea was seen at the orifice of the urethra. It seemed to be attached to the greater part of the circumference of the canal. The uterus and vagina were quite healthy. Blood, pus, and vesical epithelium, but no crystals, and nothing of the nature of a new growth, were present in the urine.

On August 8th a saturated solution of chromic acid was applied to the little tumour, and for the next day or two she passed less blood, and expressed herself as feeling much better, as she had no pain on micturition.

On August 11th the chromic acid was again applied, after which she was decidedly better, suffering no pain and passing but little blood. From August 15th to the second week in September my colleague, Mr. Andrew Clark, watched the case for me.

On August 26th the notes ran—"Not so much blood in urine; has some pain on micturating; otherwise better."

On September 8th a large quantity of blood was passed in the urine and she complained of severe pain in the back and abdomen. The bladder was examined and a suspicion of some growth in it was strengthened by a

certain unevenness of the surface being felt by means of the sound.

On September 19th I made a vaginal examination and found a vascular tumour the size of a large hazel nut projecting from the meatus urinarius. It must have presented itself here quite recently, as no trace of it was seen at the preceding examination. It was very sensitive to touch, which, in fact, gave rise to very acute pain. It was pedunculated, and so far as one could judge was attached near the neck of the bladder, just above the urethral orifice. The urine at this time was acid, contained about one fifth of albumen, but no blood; severe pain was complained of in the back and about the hypogastrium.

On September 29th chloroform was administered, and the tumour of the bladder was removed with a fine wire *écraseur*. The urethra was so dilated that the little finger was passed without difficulty into the bladder, but the point of attachment of the growth could not be felt. Soon after the operation she lost all pain on micturating, but the urine was constantly running from her. She retched a good deal and could keep nothing but ice on her stomach. The urine was albuminous but not tinged with blood.

On October 3rd sickness continued; there was no pain about the pelvis, but much was complained of in the *right* hypochondriac and lumbar regions. On examining the abdomen a distinct rounded tumour was felt in these regions, about the size of the head of a small fœtus. The patient was unaware of its existence. The outline was well marked except above, where it passed to the under surface of the liver, and even seemed to be connected with it. The urine contained no pus nor blood, and was passed painlessly though still involuntarily.

On October 4th, having asked Mr. De Morgan to examine the tumour in the loins, he was about to do so, but it was found to have quite disappeared.

On October 6th the tumour was again distinct. The

vomiting still continued, and the vomited matter was of a greenish character.

On October 9th the retching was very frequent, but the patient had been able to keep down one or two oysters, some chicken-broth, and milk. A simple enema was ordered, as her bowels were very constipated.

On October 10th the enema had had the desired effect, a large quantity of solid fæces had been passed, after which the tumour disappeared.

On October 11th the body, face, and arms were covered with a crimson exanthematous rash. Hiccough was troublesome. Another enema had been given, as she felt she required a further action of the bowels. She had been taking two oysters daily since the 8th; these were to be discontinued.

The next day the rash had almost disappeared, and the sickness and hiccough were better.

From this time to her death, on October 22nd, there was no important change to record. Sickness, a constant symptom, was sometimes more, at others less severe; the bowels were always constipated, and the fæces very hard; the urine was always passed involuntarily, and when once or twice a little was obtained and examined there was no blood in it. She was always restless at night and thirsty, but during the day dozed a good deal.

The abdominal tumour varied frequently; some days being distinct and even prominent, and in this state was more than once examined by Mr. De Morgan and others; then it altogether disappeared, to return again and be as evident as before. It did not give the impression of being firmly fixed, but it did not float, nor could it be moved appreciably from its position in the right lumbar region.

Autopsy.—An examination of the body was made twelve hours after death by Mr. Clark and myself. There was nothing requiring notice about the thoracic organs. The liver and spleen were healthy. The *right kidney* was much enlarged, and its pelvis greatly distended with urine, so that the whole formed a considerable tumour occupying

the right hypochondriac and lumbar regions. To the front surface of the distended pelvis, a portion of the small intestine was adherent by means of a strong broad band of old false membrane. The colon was not adherent to the cyst. The kidney, as well as being hypertrophied, was much congested; many of the tubes were surrounded with pus-cells, and near the surface were a few circular purulent depôts. The *left kidney* was very small, the pyramidal portion being entirely destroyed, and the cortical part much wasted, though unequally so in different parts; its pelvis and ureter were dilated, but less so than those of the right.

All the pelvic organs except the bladder were healthy. The *bladder* was contracted, and the trigone very small; there was no disease of the tissues between the orifices of the ureters and the urethra. Above the orifice of the right ureter was an oval-shaped, raised, but not pedunculated mass, warty-looking, and fissured upon the mucous surface, and of the same creamy colour as the growths on the left side; it extended upwards some distance on the right postero-lateral wall. The *right ureter* was pervious throughout; its vesical orifice was not, however, dilated.

The orifice of the *left ureter* was much dilated and admitted the uncut end of a cedar pencil; the mucous membrane of its margin was somewhat overhanging all around. Situated just above it was a pendulous vascular outgrowth three quarters of an inch in length, which hung over it like a valve; its free extremity was of a blackish charred appearance. To the median side of this pendulous mass and just above a line joining the orifices of the ureters was a nodule the size of a marble, with a broad base, projecting into the cavity of the bladder; it was firm in consistence, not vascular looking, but of a creamy white colour both on the surface and on section. Above and to the left of this for some distance the mucous membrane was infiltrated by new growth, which was raised and presented a fissured surface, the depressions or cracks of which had

also a moist cheesy or cream-coloured appearance. Attached near the summit of the bladder on the left postero-lateral aspect and hanging into the cavity by a long slender pedicle was another but smaller vascular outgrowth. The free end of this was torn and charred-looking, like that attached near the orifice of the left ureter.

The kidneys and bladder were examined microscopically by Dr. Coupland, who reported as follows :

Thin sections of the large kidney show large collections of pus-cells between and around the tubules obscuring the latter. Numerous fat-globules are also to be seen.

The small kidney shows atrophy of tubules with a considerable excess of interstitial fibrous tissue.

The bladder was covered on its mucous surface by villous outgrowth composed almost entirely of epithelium. The villi, though owing to their extreme brittleness they were broken short, showed evidence of being branched at their periphery. The submucous tissue was infiltrated with shrivelled and variously formed epithelial cells which occurred in groups between the bundles of connective tissue. In some places a small round-celled (granulation cells) infiltration replaced the epithelial growth. The characters ally the disease to papilloma or "villous cancer" of the bladder.

Remarks.—The actual nature of this intermitting tumour was not correctly diagnosed during life; but, it must be remarked, the symptom which is pathognomonic of hydronephrosis was wanting, or at any rate was not known to exist, viz. the sudden or rapid discharge of a large quantity of urine soon after the subsidence of the tumour. The sudden disappearance of the tumour alone is not sufficient to lead to a correct diagnosis; it might have been an accumulation in the bowel, or a cystic tumour of some other organ. Ovarian cysts are known to undergo great alterations in size and may discharge through the Fallopian tube and uterus, or in common with other cystic tumours can empty their contents into the bladder or intestines.

The diagnosis could have been made certain only by the discharge of urine in large quantity at the time of or soon after the disappearance of the tumour, or by the discharge of pus in the urine, in association with previous renal symptoms. In the case of *Jane G—*, however, after the discovery of the tumour, and for some days before, the bladder could not retain urine so that no relation was made out between the quantity passed and the prominence of the abdominal tumour. No difference in the quantity of urine was noticed from day to day by those whose duty it was to keep the patient dry.

Etiology.—By the light of the post-mortem examination it is not difficult to explain the origin of the tumour. It is pretty certain that the villous disease of the bladder dated back to the patient's severe illness six years before admission into the hospital; how much longer it had existed cannot be stated, but we know that such growths are often of very long standing. The left side of the bladder was the most diseased, and from it were suspended the two pedunculated masses. These during the last few months of her life had given rise to much distress after micturition by being floated onwards with the urine to the urethral orifice, where they were gripped by the sphincter vesicæ. No doubt, too, her suffering was aggravated by the contraction of the bladder upon these highly sensitive structures; for that they were highly sensitive was proved by the pain excited by touching them, when first one and afterwards the other protruded through the urinary meatus. One of these masses, as I have said, overhung the orifice of the left ureter like a valve, and no doubt obstructed the flow of urine from the left kidney.

This obstruction slowly caused the dilatation of the left ureter and pelvis of left kidney, and by the constant compression it produced led to absorption of the secreting structure. To compensate for the loss of function of the left kidney the right became hypertrophied. Meanwhile the disease of the bladder increased and at last encroached on the tissue about the orifice of the right ureter and thus

obstructed the urine from the right kidney also. Although probably never quite complete on this side, the impediment was sufficient to distend the pelvis and ureter into a large cyst, and to set up interstitial suppurative inflammation of the kidney.

As the right kidney itself was much hypertrophied in addition to its pelvis being dilated it is easy to understand how a tumour was formed large enough to be detected through the abdominal parietes of a thin person; while the occasional subsidence of the tumour is to be explained by the forcing open of the compressed lower end of the ureter by the weight of the accumulated urine above.

There is no reason for thinking that the left kidney, although its pelvis was dilated, had ever given rise to a palpable tumour; nor is it indeed likely to have done so considering how atrophied it was, and how gradual must have been the obstruction.

We have here, then, a case of double hydronephrosis, producing on one side an evident abdominal tumour, caused by the presence of villous disease of the bladder. It is the only case I am aware of in which the one condition must be considered the result of the other. Rayer in his very complete chapter on hydronephrosis gives an account of a man in whom these two conditions coexisted, but the hydronephrosis was produced by a calculus blocking up the vesical end of the left ureter. The left ureter, and the bladder near the orifice of the left ureter, were the seats of numerous small fungoid growth varying in size from a pin's head to a small pea. The calculus was formed of phosphate of lime coated with dried blood.

Some explanation seems to be required for the occurrence of an abdominal tumour in some cases of hydronephrosis and not in others. If we inquire into the causes of this morbid state we find that one of the most frequent is the pressure arising from cancer, and other diseases of the uterus, from enlargement of the prostate, and from stricture of the urethra; yet hydronephrosis, as a rule, is

only discoverable at the post-mortem examination, and it is a rare thing to find any sign of it during life.

Amongst the numerous cases of cancer of the pelvic organs treated annually in the Middlesex Hospital, none of the present surgeons¹ can remember to have seen a single instance in which distension of the pelvis of the kidney and ureter could be detected by the presence of an abdominal swelling during life; yet hydronephrosis is almost weekly seen in the post-mortem room of the hospital. Out of 52 cases of hydronephrosis collated by Dr. Roberts, of Manchester, six only were due to pelvic tumours (including cancer of the uterus), and he remarks, "Cases of this class are no doubt much more frequent than these numbers indicate; but they are generally slight in degree, and seldom go on to the production of a palpable tumour in the flank" ('Urinary and Renal Diseases,' p. 482). Howship, after discussing all the known causes of retention of urine in the ureters, agrees with M. Desault in his opinion that the most ordinary cause is scirrhus uterus, and he concludes by saying, "After all, it will generally happen that retention of urine in the ureters cannot be ascertained till after death, particularly if the affection be confined to one side, for in this case as the secretion declines in the one kidney, that of the other usually becomes more active and efficient" ('Practical Treatise on the Urine,' 1823, p. 214).

Rayer also considered (pp. 486-7, op. cit.) cancer of the uterus one of the most frequent causes of retention of urine in the ureters, and consequently of hydronephrosis and atrophy of the kidney; but he refers to three cases only which he had seen, and in only one of them could a tumour be detected. Even this was no exception to the rule, that cancer of the uterus does not lead to such distension as to give rise to an abdominal swelling, for in Rayer's case the tumour which occupied the right lumbar

* This was written before the death of Mr. De Morgan, late senior surgeon to the Hospital, whose experience of cancer was very unusually large. Mr. De Morgan's entire sanction was given to this statement as it here stands. He had read this paper before it was sent to the Society.

region during life was produced by compression of the right ureter by enlarged lymphatic glands.

I am thus led to the conclusion, from my experience of hydronephrosis in the dead subject, and after reading the description of about 50 cases of hydronephrotic tumours, that when an abdominal swelling exists there has been either sudden and complete obstruction to the urine secreted by a kidney in its full functions; or else that after one kidney has been damaged by disease, and the other has undergone compensatory hypertrophy, some obstacle has arisen to the flow of urine from the hypertrophied organ.

Instances of the first kind occur from the impaction of a calculus in the ureter, for example. Up to the time of obstruction the kidney had been rapidly secreting, it still goes on doing so, and the urine finding no exit dilates the pelvis and upper end of the ureter. Some idea of the force with which it does this can be obtained by remembering the conditions under which the urine is secreted in cases of complete retention, from stricture of the urethra; not only is the bladder distended to five or six times its normal size, but the viscera with their contents are greatly displaced, and a case has been recorded in which a portion of intestine was even expelled by the accumulating urine into the sac of a scrotal hernia. As the renal tissue becomes destroyed by compression the amount of fresh urine formed is lessened, but still the distension will increase, and the pelvis of the kidney will enlarge as long as there is any secreting structure left to add more urine to that already accumulated.

The case of Jane G— is an illustration of the second method; the right kidney was doing double work, so that when the obstruction arose the pelvis was distended with even greater force than that of a normal kidney would have been under similar obstruction, while the enlarged kidney assisted to make the swelling more prominent. Some further explanation must no doubt be sought for the enormous distension of the ureters, and the sacculation of the kidneys met with in such cases of diabetes insipidus

as are described in Beale's 'Archives,' by Dr. Strange, of Worcester, and Dr. Eade, of Norwich, but as in none of these a tumour was detected during life, I am not now concerned with them except to exclude them from the above remarks.

When, on the other hand, the obstacle is slight at first, and only gradually increases (as in cancer of the uterus and in organic stricture) there is a continual resistance rather than an actual obstruction to the flow of urine, so that the secreting structure becomes destroyed, *pari passu* with the distension of the pelvis of the kidney, and death occurs before the dilatation is sufficient to cause a tumour. In stricture, and in most cases of uterine disease, this resistance is opposed to both kidneys, and they each suffer, but cannot share, the results of the obstruction. Thus, though as Howship says there is less chance of detecting hydronephrosis in cancer of the uterus during life, "if the affection be confined to one side," the converse is true *only* when the obstruction has been confined to one side for a time and afterwards affects the other. I think facts show that it is not true when both kidneys have been acted upon similarly and for the same length of time.

Symptoms.—The previous history and the condition of this patient for some time after admission into hospital had reference to the disease of the bladder; it was only during the last month of life that symptoms were produced by the secondary disease of the kidneys.

The blood and pus found in the urine from time to time, the former very frequently, and often in large quantity, must have come from the bladder. It is true pus was found after death in the substance of the right kidney, but the suppuration was too slight and too recent to account for pus in the urine several weeks before death. Hæmaturia has been noticed in many cases of hydronephrosis, but is far from being an invariable symptom. It has been due generally either to injury inflicted by an impacted calculus; or to rupture of blood-vessels in the congested cyst-wall, for both Hunter and Howship have demonstrated

the existence of numerous vessels and good-sized capillary arteries on the inner surface of the distended sac.¹ In the presence of a vascular growth in the bladder there is no need to look further to account for the hæmaturia in the above case.

The atrophy of the left kidney did not cause any serious inconvenience so long as the obstruction was confined to its own side, and the hypertrophied right kidney was allowed to perform duty for both; but as soon as the lower extremity of the right ureter was encroached on by the vesical growth the right kidney became involved. It was after this that pain in the right hypochondriac and lumbar regions, persistent vomiting, and constipation of the bowels, occurred. These symptoms have been noticed in most cases of hydronephrotic tumours. The only one requiring further comment is the constipation; this probably was caused by the pressure and dragging of the tumour upon the adherent bowel. No doubt too, in its turn, the loaded bowel gave rise to increased obstruction in the ureter and thus augmented the size of the tumour, and by pressure upon it provoked pain and sickness. It was noted on one occasion that the lumbar swelling disappeared after an enema and the discharge of a quantity of solid fæces. This feature, which by itself might be sufficient to lead one to a wrong diagnosis as to the nature of the tumour, has also been observed in other cases of hydronephrosis.

Treatment.—There is but little to say about the treatment in such a case. With one kidney in greater part destroyed, and the other partially obstructed and in a state of suppurative inflammation, life could not have been prolonged under any treatment; all the relief it was possible to afford was given by the removal of those portions of the vesical growths which had been the cause of so much pain in voiding urine.

The amount of pressure by the tumour of the kidney on the surrounding parts was never sufficient to suggest the

* *Vide* specimens in College of Surgeons' museum.

idea of tapping. As, however, this treatment had to be resorted to in many of the cases which have been published, I shall briefly consider the question as to the best way of emptying such tumours when assistance is necessary. An attempt might be made to overcome the obstacle to the passage of urine by friction. Two cases at least are on record in which the tumour subsided after manipulation. One was under Dr. Roberts in the Manchester Infirmary, the other was reported by Dr. Broadbent. In Dr. Roberts' case the tumour was rubbed in every direction with a lubricating ointment every other morning and after the third application the patient, a girl of eight years, suddenly passed a large quantity of urine, and the swelling forthwith subsided and did not return. In Dr. Broadbent's case a child three months old, whose abdomen had been large from birth, though urine had been passed in usual quantity, had an enormous tumour which disappeared after friction with iodine ointment. The child, however, subsequently died. Probably this treatment which answered so well in these two cases was suggested by a third case reported by Mr. Thurnam in 1837. A little boy four months old had a lobulated tumour from alternate dilatations and contractions of the whole length of the ureter; the mother of the patient was in the habit of rubbing it with her hand to relieve pain, and when she did so she noticed the child's bladder swelled up as large as an egg.

In many cases, however, manipulation could not be tried; either because the tumour is far too painful to allow of it, or because the degree of distension would make the risk of rupturing the cyst-wall too great. In these cases, as well as after the failure of rubbing, paracentesis is the only means of relief and then the place for puncturing must be considered. To rely on adhesions being formed between the tumour and abdominal wall in all cases would be unwise; and to puncture through non-adherent peritoneum would be likely to lead to extravasation of urine (or pus in cases of pyonephrosis) into the peritoneal cavity, an accident which has proved fatal in more than one case.

For this reason it would often be unsafe to operate on the front of the abdomen; moreover there would be the danger of puncturing intestine, which, as a rule, is in front of, and adherent to the sac of the tumour. On the other hand, care should be taken not to injure the substance of the kidney.

Under these considerations Mr. Joseph Thomson, of Nottingham, selected the interval between the last two ribs, near their anterior extremities (vide 'Path. Soc. Trans.,' vol. xiii), as the point at which to introduce the trocar, having previously made an incision through the integument and muscles. In this spot he punctured with success on three different occasions, in the same case, a tumour of the *left* kidney.

Mr. Spencer Wells says ('Dub. Quart. Journal,' vol. xlii, p. 128, 1867), "I have twice opened peri-renal abscesses in the loin, and in one case removed a small renal calculus through the opening; but the case just related" (No. 40 in my table) "is the only one in which I have punctured the kidney through the abdominal wall. It was clearly a hazardous proceeding, but the danger of rupture of the rapidly increasing sac into the peritoneal cavity appeared to be so great, and the suffering was so excessive, that tapping appeared to be less dangerous than expectation." The tumour was on the right side, it contained between two and three pints of pus, and fluctuated distinctly at a prominent spot near its middle where an aspiratory trocar was inserted. This spot was midway between the umbilicus and the anterior superior spine of ilium.

In a case reported by Dr. Cooper Rose the tumour is described as having presented a prominent point, "equidistant from the crest of the ilium and the umbilicus on the left side," where the skin was livid and the sac thin. The cyst was tapped, it is to be inferred, at this spot.

Again, in Dr. Hillier's patient the puncture was made "half an inch below and an inch and a half to the right of the navel." These cases might be thought sufficient to prove that there is no danger in puncturing far forward,

but it is clear in those of Mr. Wells and Dr. Rose either that adhesions must have formed, or what is more probable that the peritoneum had been carried forwards so as to leave the side of the tumour uncovered by it.

In the absence of any very distinctly fluctuating spot where the skin is discoloured or the sac thin it would be best to insert the trocar near the place proposed by Mr. Thompson. If the tumour be of the left kidney, as in his case, no better spot can be selected than one just anterior to the last intercostal space; but if of the right kidney this is too high, as the liver in all probability would be traversed. I have on several occasions tested the truth of this statement in the post-mortem room, and in only one experiment did the liver escape; in this single instance it was very small and markedly distorted from cirrhosis. In one case, that of a young person with healthy viscera, whose death had been caused by a fall, the liver was considerably displaced by effused blood; but in spite of its upward displacement it was transfixd by the needle three quarters of an inch above its right free edge.

In no instance was the spleen punctured by inserting the needle in front of the eleventh intercostal space on the left side.

If there be no indication for operating elsewhere I think the best spot to select when the tumour is of the right kidney is one half way between the last rib and the crest of the ilium, between two inches and two inches and a half behind the anterior superior spine of the ilium. This spot is on a level with the front of the bodies of the lumbar vertebræ, and a needle here passed horizontally inwards will be altogether in front of the kidney, and will either transfix or pass in front of the ascending colon. It may, however, with safety be conjectured that in any case of hydronephrosis of the right side *requiring to be tapped*, if the trocar be inserted at the place I propose and directed somewhat forwards, the peritoneum and colon will be sufficiently in front to escape injury, the liver will be safely out of reach above, and the kidney behind, while the

dilated pelvis of the kidney will be tapped at its anterior and lower part.¹

¹ Mr. T. F. Pearce, Junior Demonstrator of Anatomy at the Middlesex Hospital, made for me the following notes of some of the cases experimented upon. The results in every instance were much the same.

A probe being passed through the abdominal wall from within outwards, on a level with the anterior surface of the lumbar vertebræ, and crossing horizontally the lower part of the pelvis of the kidney, pierced the following structures:

EXPERIMENT I.—Male, 65. On the right side liver traversed and peritoneum punctured. On the left side intestines and peritoneum traversed. The external aperture is just above last rib, in an antero-posterior level, 2 inches behind the anterior superior spinous process of ilium.

EXPERIMENT II.—Male, 44. On the right side liver traversed. On the left side colon and intestines (small) traversed. The external aperture above twelfth rib, in antero-posterior level, $2\frac{1}{2}$ inches behind anterior superior spine on both sides.

EXPERIMENT III.—Male, 44. On the right side liver traversed. On the left side intestines and peritoneum traversed. The external aperture opposite apex of eleventh rib, in antero-posterior level, 2 inches behind anterior superior spine on right side; but opposite apex of tenth rib, though on same antero-posterior level, on left side.

EXPERIMENT IV.—Female, 44. On the right side liver and peritoneum punctured. On the left side through intestines and peritoneum. External aperture between eleventh and twelfth ribs, in antero-posterior level, 2 inches behind anterior superior spine on both sides.

EXPERIMENT V.—Female, 56. On the right side liver with gall-bladder punctured. On the left side intestines and peritoneum traversed. External aperture between eleventh and twelfth ribs on right side, over eleventh rib on left; antero-posterior level similar to preceding case.

In both these cases, though the ureters were much distended, the needle passed over them. In the latter the right ureter was double at its upper portion for about 8 inches; it was much distended.

EXPERIMENT VI.—Male, 14. On the right side liver, &c., traversed. On the left side intestines and peritoneum traversed. External aperture just above point of eleventh rib, on an antero-posterior level, $2\frac{1}{2}$ inches behind anterior superior spinous process on both sides.

A probe being passed directly inwards through the lateral wall of the abdomen, at a point between the apices of eleventh and twelfth ribs, and in an antero-posterior level, 3 inches behind anterior superior spine of ilium, pierced the following structures:

EXPERIMENT I.—Male, 35. On the right side liver (contracted, hobnailed) not traversed. Intestines and peritoneum punctured on both sides.

EXPERIMENT II.—Male, about 40. On the right side liver, with intestine, punctured. Intestines, with peritoneum, were traversed, on left side.

In every case the intestines, with peritoneum, were traversed. In all, except one, the liver. The gall-bladder, being distended, was punctured in one. The variations of the vertical point were within one inch.

It is unnecessary to dwell upon the importance in all cases of hydronephrosis of relieving pressure from retained fæces by the use of enemata and purgatives.

Rarity of Intermittent Hydronephrosis.—The frequency of hydronephrosis as a pathological condition is well known and has been already referred to; its clinical existence as an abdominal tumour is undoubtedly rare. Still rarer is it for such a tumour to disappear spontaneously or to intermit.

I have put together in an appendix all the cases I have met with in which an abdominal tumour was observed at all (except those of congenital hydronephrosis where death occurred in utero or very shortly after birth); and it will be seen from this list that in only a few instances has there been any subsidence or intermission.

In six cases out of a total of forty-seven the tumour subsided *altogether* or nearly so, and did not reappear. In two cases already referred to it entirely subsided after friction. Of the rest (*a*) one was reported by Dr. Gintrac in which the tumour sensibly diminished after an abundant liquid motion, and then gradually disappeared altogether. The patient, a woman forty-eight years of age, died, and it was then found that a communication had been formed between the sac and the colon. It is not a very unusual thing in pyonephrosis for the sac partially to empty itself through some part of the bowel, most frequently through the colon. Such a case is mentioned by Howship, in which the tumour in this manner several times diminished though it never actually disappeared.

(*b*) Lamotte has described the case of an infant three days old, who had a large tumour in the abdomen and had passed no urine since birth, but the swelling entirely vanished after a membranous obstruction at the vesical orifice of the urethra had been broken down with a sound.

(*c*) In Dr. Hare's case, an abstract of which is given further on, there were two tumours, one of which intermitted and the other entirely subsided.

(*d*) Mr. James Johnson in 1816 published a remarkable

case in which the swelling first detected during pregnancy subsided some days after delivery and fifteen days before the patient's death. This case has been considered one of pyonephrosis rather than hydronephrosis, and such it most likely was, but Johnson, though he described the fluid as white like milk, seems not to have thought it was pus.

In only six cases is it stated that well-marked intermissions occurred. The first of these is referred to by Dr. Bright in his 'Clinical Memoirs on Abdominal Tumours,' in the following paragraph: "The third form of tumour arising in connection with the kidney is the simple distension of the pelvis and ureter with the natural secretion, owing to obstruction in the ureter or bladder. But one of the most striking cases I can at present recall has been published by my friend Mr. Estlin, of Bristol. In this instance the distended ureter produced a large tumour, which for some time excited much anxiety and great doubt as to its nature, till it was found that by a little pressure it was made to discharge its contents into the bladder, under which treatment it gradually contracted; but the ureter was found greatly enlarged and thickened after death, though it had not then been distended for a considerable time." Dr. Bright unfortunately did not give the reference to Mr. Estlin's case, but it is to be found reported, in part, in the 'London Medical Gazette,' vol. ii, 1828; and completed in vol. xx, 1837, of the same journal. The tumour was an enormous dilatation of the right ureter from obstruction caused by three semicartilaginous tumours of the prostate which formed a complete valvular impediment. No mention is made of the state of the right kidney, nor of the left kidney, nor of its ureter, and the inference therefore is that only the lower end of the right ureter was dilated. The tumour was pointed out by the patient himself many days after he first put himself under treatment. It was "of an oblong form, situated in the right hypochondrium, about the edge of the rectus muscle, extending nearly from the eleventh

rib to the right side of the symphysis pubis, and being particularly prominent about the situation of the internal abdominal ring. It somewhat distended the integuments so as to be perceptible to the eye and might be considered to be about three inches in width." Four days after it was first noticed a catheter was passed, three pints of urine were drawn off and the tumour disappeared. It formed and disappeared again and again, but always subsided after pressure and the use of the catheter; in fact, as there was no control over the bladder, the catheter was used every five or six hours, and thus the urine was not allowed to accumulate to any extent. In his first publication Mr. Estlin expressed the opinion that the tumour was a bulging of the inner coat of the bladder through the muscular layer, and thought it necessary to defend himself for not having arrived at this (as it turned out erroneous) conclusion earlier. Though the tumour was intermitting it cannot be called hydronephrosis, since it is not stated that there was any distension of the pelvis of the kidney. This, however, is only a matter of degree, for had life been prolonged, or the obstruction been at the orifice of the ureter instead of in the prostate, the pelvis of the kidney would have been dilated and the secreting structure absorbed, no doubt. This case, like Mr. Thurnam's, shows that a distended *ureter* may cause an abdominal tumour.

The second case, taken in chronological order, which I have been able to find is quoted by Dr. W. C. Roberts, of New York, in a paper "On Diseases of the Fœtus," in the 'American Journal of Medical Sciences' (1841, ii, 391). "A lady of Philadelphia gave birth to a healthy child; two weeks afterwards, the child having made no water for two days, a large fluctuating irregular tumour was found, occupying the lumbar and iliac regions, which disappeared next day after a copious flow of urine. This occasionally recurred, but when eighteen months of age the child died of long-continued irritation. The ureters were found enlarged to nearly double the size of

the large intestine, and completely distended with urine. At their pelves they partially covered the kidneys, at their entrance into the bladder they were small, and their valvular structure was entirely preserved. The bladder was larger than natural, but bore no appearance of inflammation." Nothing is said as to the state of the kidneys.

Sir Henry Thompson exhibited, for Mr. Joseph Thompson, at the Pathological Society, in November, 1861, an enormous tumour connected with the kidney which had been removed from the body of a patient of the latter gentleman. The man first sought advice in May, 1851, having suffered with symptoms of stone in the kidney for some considerable time previously. There was enlargement of and tenderness on pressure over the left hypochondriac, lumbar, and iliac regions; after passing, all at one time, more than a "pot-de-chambre" full of water of the colour of port wine he was suddenly relieved. From the end of November in the same year till the end of January, 1852, the same symptoms recurred and went on increasing in severity. The side was greatly enlarged, very tender and obscurely fluctuating; and the sufferings of the man were very considerable. The tumour was therefore tapped and eight quarts of dark coloured urine were drawn off and soon afterwards, it is stated, "the further contents of the sac flowed in the natural direction along the ureter. This could be ascertained from the quality and quantity of the urine." In December, 1852, it was necessary to tap the cyst again, which from the first had been supposed to be the dilated pelvis of the kidney. The patient got well and did not require the operation again till March, 1860, when seven quarts of fluid were taken away, not long after which the fluid again flowed *per viam naturalem*, and the patient remained well until September, 1861. The disease then progressed, as on former occasions, for twelve days, when the contents were extravasated into the peritoneal cavity through an ulcerated opening on the fore surface and towards the left side of the sac. Through

this opening the finger detected a loose, hard, calcareous body. The ureter entered the sac very obliquely at its lower part and anteriorly, and it was thought by Mr. Thompson that this position and obliquity of the ureter accounted for the closure of that tube, by pressure, when the sac was full, and the open state of it when the sac was empty.

The most extraordinary case of intermitting hydronephrosis on record is, I think, that reported by Dr. Hare in the 'Medical Times and Gazette' (pp. 29, 233, and 258) of 1857. A married woman, aged 38 years, first began to have pain in the left loin when twelve years old, and suffered from it for some years. At the age of twenty-eight pain attacked the right side of the abdomen and the loin of the same side; and with the exception of one year she was seldom afterwards free from pain. At times the pain was very severe, and then a large tumour was felt on the right side of the abdomen, which subsequently disappeared; the tumour again appeared and disappeared on several occasions. In 1855 a large tumour was also discovered in the left side of the abdomen; this disappeared some time before death and did not again become evident. Death occurred with symptoms of uræmic poisoning. On post-mortem examination very considerable double hydronephrosis was found to have existed; the right kidney and its pelvis were still distended, the left was almost empty. Dr. Hare was inclined to the belief that the cause of the obstruction was a congenital one; the only detectible obstacle to the flow of the urine was a twist in each ureter upon its own axis. As soon as the ureters were dissected up a little from the tissues surrounding, and the coil untwisted, the urine which had accumulated in the right side gushed out freely. The coincidence of the two kidneys being so similarly yet so peculiarly affected is, indeed, as Dr. Hare says, truly remarkable. The patient first came under Dr. Hare's notice in 1854.

Dr. Hillier, in the 48th volume of the 'Transactions of the Royal Medical and Chirurgical Society,' refers to a

case under his observation in 1855. It was that of a married woman who for three or four years had been subjected to attacks of pain in the right side of the abdomen attended with an oval swelling in the right lumbar region which disappeared as the pain subsided. During the height of the attacks the urine was very scanty, but afterwards was very abundant and turbid for some days. The patient was alive ten years afterwards and had not had entire suppression since 1855.

The most recently reported case I have met with formed the subject of a paper by Dr. Thomas Cole, of Bath, which was read before the Bath and Bristol Branch of the Medical Association, and is reported in the 'British Medical Journal' of September, 1874. A young man, æt. 23, who was first seen by Dr. Cole in 1873, had enjoyed good health till three years previously, when he was seized with pain in the left lumbar region, accompanied by sickness. It lasted a few hours. The attacks recurred at intervals of one or two months. Latterly the intervals had been shorter, not more than a fortnight; and the attacks lasted from a few hours to several days. The bowels were generally confined. Never noticed anything wrong with his urine, which on examination contained nothing abnormal except a superabundance of octahedral crystals of oxalate of lime. During 1873 the intervals varied from one to seven weeks, showing a general tendency to become less and less frequent. A tumour was felt in the left side of the abdomen very shortly after the commencement of each attack, which distinctly pushed the belly of the left rectus muscle forward, and altered the contour of the front surface of the abdomen. There was obscure resonance in front of the tumour. Fluctuation was not satisfactorily made out. The tumour was easily moved about, and could be made to descend one or two inches by a deep inspiration. During the attack the urine decreased to $\frac{3}{4}$ pint, in the intervals it varied from $1\frac{1}{2}$ pints to 3 pints; when the swelling passed away the quantity was increased to $1\frac{1}{2}$ pints in the day, and was voided very frequently—

three times in an hour or so. As a rule the tumour went away very rapidly, for instance, on one occasion the swelling was as large as ever at 11 p.m.; at 4 a.m. the patient awoke and found it gone, and at 10 a.m. Dr. Cole could find no trace of it. The patient is still under treatment, but the diagnosis is that a calculus of oxalate of lime is lodged in the pelvis of the kidney, and occasionally causes obstruction by falling over the entrance to the ureter.

A notable symptom in this case, and one I do not remember reading of in any other, was the large quantity of liquid *expectorated* during the attack, which had the characters of a mixture of saliva and gastric juice. More than a pint and a half of this was expectorated during one attack.

Dr. Cole has been good enough to give me information about his patient up to the present time, and on February 15th, 1876, he wrote: "Some months ago my patient while on a visit to London was seized with one of his attacks after an interval of nearly a year. It was severe, and up to this time the swelling, which always subsided before, had not disappeared. He suffers no particular pain and seems fairly well in health, but there is the swelling and I fear it has become permanent. Sir W. Jenner saw him during the illness, and came, I believe, to a similar conclusion to mine; at all events diagnosed a kidney tumour."

I am indebted to Mr. Bryant, of Guy's Hospital, for the following notes of an unpublished case which he saw in consultation with Dr. Emanuel May.

Mrs. S—, æt. 47, of 25, — Street, Regent's Park, when twenty years of age had a swelling in the abdomen which subsided spontaneously after she had passed urine of a coffee-ground character.

Soon after the disappearance of the tumour, which had been considered to be ovarian, the lady was married. She remained well, and had two children between her marriage and eight years ago, when she was attacked with typhoid

fever. Then the abdominal swelling recurred and a tumour, which steadily increased in size, formed in the left loin. Her general condition associated with these symptoms caused alarm, and, in fact, Mrs. S— became very ill indeed, and was not expected to live; but at the expiration of fourteen weeks a copious discharge of blood and pus took place from her bowels and continued for several weeks. Ultimately she quite recovered from this illness, the tumour disappeared, and the abdomen returned to its normal dimensions. Again she remained well for a long time, but on the 18th of May, 1874, pain and swelling occurred once more in the left loin. Six days later there was a soft tumour above the left iliac fossa which was thought to be fæcal.

On June 2nd the swelling extended from the ribs to the crest of the ilium and was tense though elastic; the urine was of a very high colour and looked as if it had been mixed with bile. A few days later the tumour, which was then supposed to be “suppurating hydronephrosis” of the left kidney, reached as far as the umbilicus.

On June 6th Sir W. Jenner saw the patient and suggested that the tumour should be tapped; this was accordingly done and ninety ounces of offensive pus were drawn off by Mr. W. Adams, of Harrington Square, in whose practice the case occurred. The operation was followed by some improvement, but on the 16th of June the sac refilled and three pints of foetid greenish fluid were removed with the aspirator.

On June 28th the urine for the first time contained pus as well as blood.

On July 3rd the tumour had again refilled; Mr. Bryant was then called in to see the patient and laid the sac freely open by an incision such as is made for the operation of colotomy. The kidney was felt by the fingers introduced through the wound, and a quantity of offensive purulent fluid mixed with lymph and broken-up tissue was evacuated. Considerable relief was given by the operation, but death from peritonitis took place ten days later. A post-mortem

examination was made, but I have not been able to obtain the details of it.

It would be found upon inquiry, I think, that pyonephrosis has given rise to an abdominal tumour much more frequently than hydronephrosis. In searching for cases of the latter kind only, to tabulate them for an appendix to this paper, I have passed over all which were throughout unquestionably cases of pyonephrosis.

In some instances, however, the abdominal tumour, which at a later period was pyonephrotic, seems not to have been so at an earlier date. These I have included in the subjoined list. The case last quoted was no doubt one of this kind, as the swelling subsided entirely on one occasion without the escape of any fluid other than blood and urine.

In conclusion, I would suggest that in all probability a great number of the tumours which, having been called *ovarian* upon good authority, have, nevertheless, vanished spontaneously, were hydronephrotic in nature and disappeared by a normal process through a normal outlet of the body. It is a noteworthy fact, and one showing the liability to error in diagnosis in such tumours, that of the twenty-three cases included in the first part of the subjoined table twelve occurred in females, and of the twelve women no less than seven were regarded as suffering from ovarian disease; while of these seven five were submitted to the operation of abdominal section on the strength of this wrong opinion.

Mr. Wells also, in a table of cases supposed to have been ovarian "in which an exploratory incision was made," includes two of renal cyst. In each the cyst was "exposed, tapped, and drained." Both patients recovered and remained well for some time afterwards. These two cases are not included in the following appendix because the nature of the cyst, whether hydronephrotic or otherwise, is not mentioned.

Note to Appendix.—In the course of the discussion on this communication Dr. Hare referred to two other cases which had been under his care, in each of which hydronephrosis had given rise to an abdominal tumour. In each case the patient was a young woman; in each the tumour intermitted; in one it was on the right side, in the other on the left.

In April of this year my attention was drawn by Dr. Fagge to a case in the clinical ward at Guy's Hospital, under his care, and to his kindness I am indebted for the following note of it.

A married woman, æt. 37, the mother of five children, had a globular tumour six inches in diameter situated in the left lumbar and iliac regions. Just previously to her last confinement, about two years before admission, she had felt aching pains in the left side of her abdomen which, however, were not continuous. The tumour had only been detected six weeks; it was moveable, not very tense, and there was resonance in front of it. It was neither painful nor tender. It fluctuated. The urine, dark at times, was generally clear and without any deposit; sp. gr. 1022, acid; it contained neither albumen nor sugar. The tumour was tapped on May 1st, and forty-five ounces of a limpid opalescent fluid were withdrawn. This fluid was odourless, neutral, contained no hooklets; a few epithelial cells were seen under the microscope. It gave no reaction with heat and nitric acid, nor with Pavy's solution. Its specific gravity was 1004. Some of it was evaporated to dryness; scarcely any residue was left, and what there was consisted of sodium salts. Tests for urea and uric acid gave no reaction whatever. The patient left the hospital on May 20th, 1876. Subsequently to the tapping a round hard substance could be felt in the left loin, in the situation of the kidneys.

This tumour was considered to be, and no doubt was, of hydronephrotic nature. The cause of it was not ascertained.

It is very noteworthy that the fluid did not present the

normal characters of urine, but in fact consisted of water with a large quantity of chloride of sodium and a few cells.

Such clear limpid fluid-contents have been found in other instances. Sir James Paget has mentioned to me a case he had seen in which the fluid contained in the cyst was very pale and very unlike ordinary urine in odour, colour, and other characters.

I have referred to this point and have suggested an explanation of it in a communication on 'Congenital Hydro-nephrosis.'

Cases of hydronephrosis in which an abdominal tumour was formed.
A.—Those in which the tumour never spontaneously subsided or intermitted.

No.	Reference.	Authority.	Brief abstract of case.	Variations of tumour.	Remarks and post-mortem examination.
1	Lancet, 1861, vol. ii, p. 472	Dr. Farre	A man, æt. 46, who for years had been subject to pains in the abdomen, had been ill for five months, when a tumour was discovered in the right side. The tumour was several times tapped, and iodine was injected. Death occurred in eighteen months	The tumour filled up after each tapping. It never subsided except as the result of tapping	Supposed to be a hydatid tumour of the liver. A calculus impacted in the ureter had led to sacculatation of the kidney and distension of its pelvis.
2	Philosophical Transactions, 1747	Mr. Samuel Glass	A woman who was born dropsical lived to be 23 years of age. She was well proportioned, except for the enormous size of the abdomen, which had been disproportionate all her life. The only symptom was pain on passing urine. The tumour was on the right side. The abdomen at the time of death was 6 feet 1 inch in circumference, and from xiphoid cartilage to os pubis it measured 4 feet $\frac{1}{2}$ inch	No subsidence or diminution of tumour	The tumour was due to distension of the right kidney; it contained 30 gallons of light-brown limpid fluid. The ureter of this kidney was abnormal in course, and opened very obliquely into the cavity of the sac. It then passed upwards and to the right for twelve inches, whence it was deflected downwards.
3	Göttingen gel. Anzeigen, 1777, s. 1196	Haller, quoted by Rayer, vol. iii, p. 486	A woman who for years had suffered from dropsy had had also for several years a tumour below the umbilicus	No variation in size of tumour mentioned	The tumour was formed by one of the kidneys, which had become degenerated into a membranous sac, white, and filled with water. The other kidney was quite healthy and in its proper position.
4	Medical Commentaries, Martineau, vol. ix, p. 282, 1785	Mr. Phillip Martineau, of Norwich	A man was admitted into Norwich Hospital with a large tumour on the left side of the abdomen, which fluctuated. Two years previously he had been in hospital for the same complaint, and had been tapped. Till within two or three months of readmission he had remained well. The encysted tumour was now punctured with a lancet, the fluid escaped into the peritoneal cavity, and death resulted	No subsidence of tumour except after tapping	The left kidney was dilated into a cyst large enough to contain eight pints. The cause of obstruction was not discovered. Mr. Martineau "knew of no other case except by Lientaud."

No.	Reference.	Authority.	Brief abstract of case.	Variations in tumour.	Remarks and post-mortem examination.
5	Traité des Maladies des Enfants, 1928	Billard	A male child four days after birth had a round soft tumour in the lumbar region. The child lived a month, but gradually became worse. The tumour was of the right kidney	No subsidence of the tumour	The right kidney had no trace of its natural structure, and its pelvis terminated in a <i>cul de sac</i> . The ureter was natural towards the bladder, but near the kidney it had the form of two imperious cords, which became more subdivided, and were applied to the kidney in the form of a goose's foot.
6	De curand homin. morbis, vol. ii, sect. i, S. 743	Frank, quoted by Rayer, p. 486	A young man died in the hospital in Vienna, whose left kidney was so dilated that it filled the whole abdominal cavity	No subsidence of the tumour mentioned	The cyst contained more than 60 lbs. weight of a fluid, rather aqueous than urinous. There remained nothing of the kidney but its capsule.
7	Journal hebdomad., t. i, p. 81	Reynaud, quoted by Rayer, p. 486	A man, who died accidentally from fracture of the skull, had an enormous dilatation of the left kidney. It is probable that the altered state of this kidney exercised no injurious effect on the person's health, as the right kidney did duty for it	No subsidence of tumour	The left kidney was transformed into a pouch containing a great quantity of fluid paler than normal urine. The ureter was so narrowed that a pin was introduced with difficulty. The right kidney was larger than usual.
8	Gazette des Hôpitaux, 1832, p. 451	M. Piorry, quoted by Rayer, p. 486	This was a case in which the right kidney was enormously dilated, so as to form a tumour a foot in length and five or six inches in width	No mention of any subsidence of the tumour	The right ureter was plugged by a calculus.
9	Traité des Maladies des Reins, tom. iii, p. 487	Rayer	A woman, æt. 40, who died in Le Charité with cancer of the uterus, had the right kidney so dilated that it gave rise to a fluctuating and bossy tumour in the right side	No subsidence	The right ureter was compressed by indurated and enlarged lymphatic glands situated between the uterus and the iliac muscle. The left kidney and ureter were unaffected. The fluid in the cyst was yellow and without odour.

10	Traité des Maladies des Reins, tom. iii, p. 490	Rayer	A man, æt. 64, having been seized with pain all over the abdomen, but especially severe about the left kidney, was compelled to keep his bed. No urine was voided, nor was there any desire to micturate for ten days. The bladder was not distended. There was a large tumour, which stretched obliquely from the right hypochondriac towards the left iliac region, which was thought during life to be distended right kidney. The patient died in less than a month from the commencement of this attack. At the age of 22 pain had been felt in the region of the right kidney, which extended along in the direction of the right ureter, and blood was passed by the urine. Little by little he improved, and remained well for several years. For fourteen years before the final illness the abdomen had been increasing	Continual increase in size of tumour Upon this case Rayer remarks that the alteration of the right kidney accounts perfectly for the old illness of the patient and for the cause of death, which was inevitable when the left kidney (the only one excreting urine) became involved	The right ureter was completely plugged at one spot by an impacted calculus. Above the obstruction the ureter was dilated, below it was of the ordinary measurement. The left kidney was swollen and red, and its pelvis was notably dilated; the left ureter contained a small calculus about five inches from its upper end.
11	Arch. f. d. Hollandische Beitr. z. Natur und Heilk., Bd. i, p. 186	Boogard	A young man, æt. 20, had suffered from time to time from vomiting; a doubtfully fluctuating swelling was detected in the right flank; death occurred five days afterwards	No subsidence	The right kidney was affected, the left was natural. The right renal artery divided into two branches, the lower of which compressed the ureter. Subsequently the upper part of the ureter became adherent to the surface of the tumour.
12	Wiener Med. Halle, 1864, p. 189	Prof. Dumreicher	A girl, æt. 13 years, had a swelling in the abdomen from her tenth year; it grew enormously and uniformly distended the belly. It was frequently tapped and injected, but always refilled.	No subsidence except as the result of tapping	The right kidney was the one which formed the tumour. The left was hypertrophied. The cyst was divided into compartments and these into loculi. The cause of the obstruction was not clearly made out. It was considered to be congenital, and due to obliquity of the ureter.

No.	Reference.	Authority.	Brief abstract of case.	Variations in tumour.	Remarks and post-mortem examination.
13	Langenbeck Archivf. Klin.-Chir., 1865, Band vii, p. 219	Krause	Hydronephrotic cyst mistaken for ovarian. Excision attempted. Death next day. The tumour had been tapped one year before under the belief it was ovarian	No subsidence	The kidney was entirely atrophied, and its pelvis enormously distended. The cause of obstruction was a valvular flap of membrane at the renal orifice of the ureter.
14	Berlin Klin. Wochenschr., vi, p. 23, 1869	Prof. Simon's Clinic, Heidelberg	A hydronephrotic tumour was punctured with trocar and cannula, and the cannula was left <i>in situ</i> . Death from peritonitis followed twenty-two days after the operation upon what was considered to be an ovarian cyst	No subsidence before tapping	The ureter was not permeable, but the cause of its closure was not explained by post-mortem examination.
15	Path. Soc. Trans., vol. xiii, p. 151	Dr. W. J. Little	A male, of 6½ years, had at 2 years been treated for ascites, and was relatively as large in the abdomen as a woman at the full period of gestation. He was born with a large belly, which had gradually increased to this condition. Paracentesis had been performed at 3½ years of age. Limpid fluid was evacuated. Several tapplings were performed, and ultimately a fistulous opening was established. The nature of the case was diagnosed before death	No subsidence except as a result of tapping	The right kidney formed a large cyst. The left was also sacculated. No explanation of the origin of the disease.
16	On Urinary and Renal Diseases	Dr. Roberts, of Manchester	A woman who was supposed to be suffering from ovarian disease, and who had been twice tapped under this idea, died of peritonitis after the second tapping	No subsidence except as the result of tapping	The right kidney and its pelvis were monstrously dilated. The ureter opened so obliquely into the pelvis of the kidney as to be quite valve-like.
17	Wurt. Correspondenz Blatt, Bd. xii, p. 266	Faber	A little boy, 5½ years, who had been ventricose from birth, fell from his chair and died suddenly from the injury received thereby	No subsidence	Both kidneys and their ureters were distended. No cause mentioned.

18	Glasgow Med. Journal, vol. ii, 1867	Dr. A. R. Simpson	While making experiments in acupuncture, the body of a woman, æt. 50, was supplied, who had complained a few days before her death of an abdominal tumour. It was regarded as an ovarian tumour, but as it caused no uneasiness no special examination was made of it during life	No subsidence	The right kidney formed a cystic tumour as large as a fetal head. The cause was a thickened band of fibrous tissue which passed along the brim of the pelvis from the promontory of the sacrum and compressed the right ureter. The left kidney was hypertrophied. Left kidney pale and flabby, but increased in size. Right kidney immensely distended into tumour, which extended from the lower surface of liver to pelvic brim. The colon was adherent to tumour, so was the right ureter. The latter was pervious and slightly dilated, and bent upwards on the cyst very suddenly. After dissecting off the ureter from the cyst 98 ozs. of healthy, high-coloured urine of sp. gr. 1011 flowed away through it.
19	Edin. Med. Journal, vol. xiii, p. 468, 1867	Dr. Bryce, of Dalkeith	A large tumour occupied the right lumbar and iliac regions of a pregnant woman. Towards end of gestation the uterus was confined to the left iliac fossa, and did not reach to within two inches of the umbilicus. The tumour in the right side was always spoken of by the patient as being like "a river in her side." Death occurred within a short time after delivery, and the tumour of the right side did not subside before that event. The patient was seen during life by Sir A. Simpson. The p.-m. examination of the body was made and reported on by Dr. A. R. Simpson	No subsidence	The right kidney was converted into a large multilocular cyst, formed by the dilated calyces and pelvis, which were in part occupied by intra-cystic growths. The ureter had been cut off and was not examined. The hydronephrosis was thought to have been associated with echinococcus cyst, but no proof of this was found on post-mortem examination.
20	Path. Soc. Trans., vol. xxv, p. 174, 1874	Drs. Woodman and Cayley	A male child, æt. 5 months, had from birth a larger abdomen than normal. After three months it increased, and the child passed but little water. A large semisolid feeling tumour occupied the right side, and seemed attached to the liver. It was tapped, and echinococci were said to be contained in the 4 oz. of blood-stained fluid (sp. gr. 1010) which were withdrawn. No urea in fluid. Three other punctures at intervals of 6—12 days allowed of more blood-stained fluid being removed. This fluid contained urea, but no traces of hydatids. Death from broncho-pneumonia occurred a few days after the last tapping	No subsidence except as the result of tapping	

No.	Reference.	Authority.	Brief abstract of case.	Variations in tumour.	Remarks and post-mortem examination.
21	Archiv f. Gynäköl., 1870.	Dr. Schetelig	An enormous hydronephrotic tumour was removed under the idea that it was ovarian. Death. The left kidney was the one affected	No subsidence	—
22	Dublin Quart. Journal of Med. Science, Feb., 1867; also Diseases of the Ovaries, pp.208 <i>et seq.</i> ; also Path. Soc. Trans., vol. xviii, p. 167	Spencer Wells	A married woman, æt. 43, "suffered much from the urine" from her fourteenth year. At this time she was felled to the ground by a blow on the abdomen with an iron shovel, and for eighteen months subsequently she was ill. For years afterwards she suffered pain and distress, which she referred to this injury. All her married life (26 years) she repeatedly suffered deep-seated pain in the abdomen, and her pregnancies (9 in number) were always attended with distress. When 39 years of age she had had a swelling in the hypogastric and left lumbar region the size of an infant's head, which was thought to be ovarian; the swelling had existed for eight years. It increased, and was tapped in the linea alba, when two gallons of dark fluid were withdrawn. Five months later she came under Mr. Wells, and soon afterwards was operated upon for ovarian tumour	No subsidence except as the result of tapping	The right kidney was enlarged and soft, the calyces and pelvis were much dilated, and the thin sac formed by this dilatation had given way longitudinally. A calculus formed a perfect cast of one calyx. The bladder was contracted, the uterus and ovaries were healthy. The left kidney formed a cyst larger than an adult head. The stroma was in fact atrophied, in part hypertrophied. The spleen, pancreas, pyloric end of stomach, duodenum, coils of small intestine, and other structures were very firmly adherent to the cyst wall. No cause mentioned of obstruction on this side.
23	Diseases of the Ovaries, pp.216 <i>et seq.</i>	Spencer Wells	A girl, æt. 16, fat and of florid complexion, had found her abdomen increasing since her twelfth year, though not sufficiently to attract any particular notice till she was seized with pain on the right side. When she was admitted into the Samaritan Hospital fluctuation was distinct over the lower part of the belly, and the movements of a cyst were dis-	No subsidence before operation	Death on fourth day after operation from uræmia. The left kidney was so atrophied as to be almost useless. The right kidney was in great part converted into a cyst which held 12 pints. This case is very remarkable from the rapid and great elevation of

temperature after the operation. For several hours before death the temperature exceeded 111°.

B.—Cases quoted in the text in which the tumour intermitted.

24	Medical Gazette	Mr. Estlin	<i>vide text.</i>
25	American Journal of Medical Sciences, "On Diseases of the Fœtus," 1841, ii, 391	Dr. Roberts, of New York	A healthy male child, æt. 2, seized with retention of urine. A large, fluctuating, irregular tumour was formed, occupying the lumbar and iliac regions, which disappeared next day after a copious flow of urine. This occasionally recurred. Death at eighteenth month

No.	Reference.	Authority.	Brief abstract of case.	Variations in tumour.	Remarks and post-mortem examination.
26	Path. Society Trans., vol. xiii, p. 128	Sir H. Thompson, for Mr. Joseph Thompson	Abstract given in text	The tumour subsided and remained well for nine months; it refilled, and did not again subside except after tapping.	<i>Vide</i> text. The peculiarity of this case is the long temporary relief given by the tapplings.
27	Med. Times, and Gazette, 1857, vol. i, pp. 27, 233, and 258	Dr. Hare	<i>Vide</i> text.		
28	Med.-Chir. Trans., vol. xlviii, p. 98	Dr. Hillier	<i>Vide</i> text.		
29	British Med. Journal, 1874	Dr. Cole, of Bath	<i>Vide</i> text.		
c.—Cases quoted in the text in which the tumour subsided entirely.					
30	'Urinary and Renal Diseases'	Dr. Roberts, of Manchester	A little girl, æt. 10. The tumour was shamed three times; after the third manipulation she suddenly passed a large quantity of urine, and the tumour subsided	Subsidence after friction	
31	Path. Soc. Trans., vol. xvi, p. 164	Dr. W. H. Broadbent	Tumour in a female child, between 3 and 4 months old	Subsidence after friction	Both kidneys were affected. The obstruction was due to valves of mucous membrane near pelvis of each kidney. Urethra not examined.

32	Sydenham Soc., Bien. Retrosp. 1867 and 1868, p. 175	Dr. Gintrac	A woman, æt. 48, began (1865) to suffer from vomiting and alternate diarrhoea and constipation. In 1866 she was worse, and a tumour was observed in her left flank. The urine was clear and healthy on February 7th. On the 20th, after abundant liquid stools, the tumour sensibly diminished, and then gradually disappeared. The patient died	Subsidence of tumour by escape of urine per rectum	The secreting structure of the kidney was nearly destroyed. No calculus was found. The ureter was healthy.
33	Traité des Accouchements, liv. 1, ch. xxiv, 128	Lamotte	<i>Vide</i> text.		
27 v. 2.	Medical Times and Gazette, 1857	Dr. Hare	This is the same case in which the tumour formed by the right kidney intermitted, and therefore it is referred to in preceding table also. The tumour of the left kidney subsided on one occasion and did not refill. This case is included under those hydronephrotic cysts which subsequently suppurated. The tumour <i>almost</i> disappeared on one occasion, nine days after confinement and fifteen days before death of patient	<i>Vide</i> text.	
34	Medical Chirurg. Journal and Review, vol. ii, 1816	Mr. James Johnson			

D.—Cases in which the tumour diminished but never subsided.

No.	Reference.	Authority.	Brief abstract of case.	Variations in tumour.	Remarks and post-mortem examination.
35	Path. Soc., vol. xiii, p. 137	Dr. Dickinson, for Dr. C. Hastings	A woman, æt. 70, had had for twelve years a tumour in the left hypochondrium, which at length filled the abdomen. She occasionally passed "nasty stuff" by the urethra, and the tumour then diminished somewhat in size. The tumour had been diagnosed ovarian	Although the tumour is said to have diminished, it never subsided. In spite of occasional variations, there was, on the whole, such a progressive increase that the whole belly was at last filled by the tumour	The left kidney was converted into a sac full of a colloid or gelatinous substance. No obstruction found in ureter. Tumour probably caused by a calculus at some time impacted.
36	'Urinary and Renal Diseases,' ed. ii, p. 433	Dr. Roberts, of Manchester	A male, æt. 20, had from the age of 2 years been subjected to attacks of constipation, which became more frequent and severe. During the attacks the belly was swollen and tender. When under Dr. Roberts in 1867 an attack was closely observed. During it the urine was scanty, the abdomen was distended, and in each loin there was a bulging. No actual and defined tumour, but a general swelling of abdomen. Patient partially recovered from this attack, and died in another very shortly afterwards. Diagnosis made out accurately	It is stated that after copious discharges of urine and relief of intestinal obstruction, there was a sensible diminution in the elastic swelling on the left side	Both kidneys affected. The left was the larger cyst of the two. The upper end of left ureter was contracted, and opened so obliquely into the pelvis of kidney as to form a valve-like obstruction. Contraction congenital. On right side distension was due to an abnormal branch of the renal artery.

37	Lancet, 1865, vol. i, p. 317. Med. Chir. Trans., vols. xlviii and lii	Dr. Hillier	Patient was born with a large abdomen, which simulated ascites till he was 4 years old. The swelling was then diagnosed as being a cyst of the right kidney. For a long time treatment for ascites was employed. After the tumour was rightly diagnosed it was frequently tapped	There was occasional reduction in the size of the tumour. The abdomen varied from twenty-four to twenty-nine inches before the first tapping	Death from acute tuberculosis. The cyst contained eighty-three ounces of pale lemon-coloured fluid. There was marked contraction of the lower end of the right ureter. The left ureter and pelvis were also slightly dilated, and contained some calculus and matter.
38	'Diseases of the Urine and Urinary Organs,' ed. 1893, p. xlviii	Howship	A young lady, æt. 24, first observed an enlargement of the abdomen in 1816, which slowly increased till it equalled an eighth month pregnancy. The tumour continued, and on November 5th, 1818, she first had retention, and the catheter was daily used till November 10th, when the urine declined from two quarts to a few ounces, and so continued till December 8th. Then influx took place and lasted twenty days, during which over seventeen gallons of urine were drawn off with the catheter. In May urine passed by the bowels, and then afterwards alternated, passing sometimes by the bowel and sometimes by the urethra, either through the catheter or in spasmodic gushes	There were occasional variations in the size of the tumour, but no complete subsidence	This case was not followed to the end. It was under Mr. Heavyside.
39	London Med. Gaz., vol. xx, 1837, p. 717	John Thurnam	A male child was born with tumefaction of the lower part of the abdomen, especially of the right side. It looked like two or three bladders. No urine passed till the third day after birth. The mother used to rub the abdomen to relieve pain, and in doing so she noticed that the bladder would swell and rise up under her hand to size of a large egg. The left ureter chiefly formed the tumour, but the left kidney was very large and its	Frequent alterations in size followed friction on the surface of the abdomen	The right kidney was completely atrophied, not being more than quarter of usual bulk, and showing no trace of division into cortical and medullary parts. There was no right supra-renal capsule. The right ureter, a little way from the pelvis, was represented by a thin impervious cord for about one inch, but the vesical

No.	Reference.	Authority.	Brief abstract of case.	Variations in tumour.	Remarks and post-mortem examination.
40	Traité des Maladies des Reins, tom. iii, p. 492	Rayer	<p>pelvis was dilated. The kidney and ureter form one of the specimens of the Hunterian collection</p> <p>A man, æt. 50, was admitted into La Charité under Lermnier. He had a fluctuating and slightly painful tumour in the left flank. This tumour sank, and the urine became bloody. Rayer diagnosed a distended kidney. The patient died some time afterwards</p>	Diminution of tumour on one occasion	<p>end was pervious and of more than normal calibre. It opened into the bladder as usual. The left kidney was about double its normal size. The ureter formed four large large sacculated dilatations communicating with each other by constricted intervals of the tube. The dilatations extended from pelvis of kidney to bladder. No cause was found of the lowest dilatation. The urethra was not examined.</p> <p>The ureter was distended as well as the pelvis and calyces. The renal substance had been quite destroyed by comparison. The cause of the distension was impaction of a calculus in the vesical end of the ureter. Fungoid growths in bladder and lower end of left ureter. Right kidney not affected.</p>
41	Ditto, p. 495	Rayer	<p>A boy, æt. 17, entered La Charité in 1836. Had always been delicate, his limbs were rachitic, and he walked with crutches. Had had pain in the left renal region, with vomiting, at intervals for seven years. There had never been retention of urine; two years before he had passed blood during an attack of pain. At the time of admission there was general swelling of the abdomen and a fluctuating tumour was detected in the left flank.</p>	Diminution in size of tumour two days before death	<p>Both kidneys were atrophied and their pelvis dilated. Congenital contraction of the ureters, the left being more affected than the right. Neither was completely occluded.</p>

42	Histoire de la Soc. Royale de Médecine, 1781, p. 272	Halle	<p>Retention of urine occurred, and the catheter was required for five days on one occasion. After this attack the tumour diminished somewhat; death occurred two days later.</p> <p>Double hydronephrosis in a woman, <i>æt.</i> 41, was occasioned by renal calculi. Two years before the death of the patient there was found a tumour in the right flank. Patient died of what was called "malignant fever, produced by violent grief"</p>	The tumour subsided to three quarters of its size	<p>The right kidney formed a soft membranous mass eight inches long and five wide. It contained nodes, a quantity of fluid, four large calculi.</p> <p>The remains of the left kidney could not even be found except by tracing carefully along the left ureter. It was only represented by a small membranous sac, which contained some fluid and a calculus.</p>
43	Path. Soc. Trans., vol. xii, p. 174, 1871	Dr. Heywood Smith	<p>A married woman, <i>æt.</i> 27, died in the Hospital for Women after having been tapped four times. Swelling in left loin began four months after confinement. First blood, then thick yellow matter, and afterwards fetid pus followed the tapplings. The tumour fluctuated and extended from ribs to pelvis. Death resulted apparently from the escape of pus into peritoneal cavity</p>	No variations in size of tumour mentioned, except as the result of tapping	<p>The obstruction was due to a rough calculus, which was lodged in the pelvis of the left kidney.</p>

E.—Cases in which the contents of the tumour became purulent, i. e. the hydronephrotic cyst became pyonephrotic.

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No.	Reference.	Authority.	Brief abstract of case.	Variations in tumour.	Remarks and post-mortem examination.
44	Path. Soc. Trans., vol. xxiii, p. 159, 1872	Dr. Pye Smith	A farrier, æt. 24, after being kicked "under the short ribs," passed blood with the urine. This happened two years before a tumour was discovered. The tumour gradually occupied the left half of the abdomen. It was twice tapped; the first time six pints and a half of opaque reddish fluid containing pus were withdrawn. The cause of the tumour was supposed to be an injury to the ureter as a result of the kick	No variations in size mentioned, except as the result of tapping	Tumour was formed by the dilated left kidney, which was firmly adherent to parts around. The ureter was dilated for an inch and a half, and then suddenly became contracted so as not to admit the smallest probe. No calculus. The cyst communicated with the adherent intestine.
45	Med. Chir. Trans., vol. li	Dr. Cooper Rose	A young lady suffered from a tumour of the abdomen for fifteen years. It was tapped, after which a sinus persisted. It was throughout supposed to be ovarian. It remained stationary for a long time, and then increased irregularly till tapped, when it diminished slowly until it was only as large as a man's fist. This happened after a fistulous opening had been established. It was found after death that the fistulous channel had hollowed out the supra-renal capsule	The only change up to the time when the tumour was tapped was one of increase in size	The kidney, which was closely adherent to the supra-renal capsule, formed a large cyst containing thin ochrey matter and shreds of bloody pus; the tubular tissue had entirely disappeared, whilst the cortical part was reduced to a pale thin stratum. The ureter had degenerated into a hard thin cord and was entirely closed up.
46	Dublin Quarterly Journal of Med. Science, February, 1867	Mr. Spencer Wells	A case of a woman, æt. 50, the mother of five children. A tumour, due to the blocking of the ureter by calculi, was formed in the right side of abdomen, and extended from ribs to pelvis and outwards to umbilicus. It was twice tapped, and recovery followed the passage of two calculi by the urethra a month after the second tapping.	The tumour increased up to the time of tapping, and subsequently refilled. Ultimately it completely disappeared, and the	This patient was well seven years after the first tapping. The case is related also in Mr. Wells' work on 'Diseases of the Ovaries,' p. 205, <i>et seq.</i>

47	'Diseases of Urinary Organs,' p. 209, ed. 1823	Howship	<p>Although the fluid which flowed through the sinuous opening was sometimes clear and urinous, it is not certain whether this was a case of <i>hydronephrotic distension at first, or whether the distension followed pyelitis</i></p> <p>A young medical man for ten years had been subject to painful nephritic attacks. He was at length destroyed by his disease. The principal symptom was a gnawing fixed pain about the left kidney, increased by pressure or motion.</p> <p>The urine was once or twice slightly bloody, but was never purulent</p>	sinus quite closed up	No change in tumour is described	Three pints of milky fluid were contained in a large tumour which occupied the left lumbar region. The kidney structure was entirely destroyed. A calculus blocked the upper orifice of the ureter.
34 v. s.	Medical Chirurgical Journal and Review, vol. ii, 1816	Mr. Johnson	<p>A woman, æt. 40, in eighth month of pregnancy, presented two abdominal tumours separated by a sulcus, one of which was the pregnant uterus, the other a distended kidney. It remained after delivery and increased. It was supposed to be ovarian. The tumour almost disappeared nine days after delivery and after a large quantity of milky fluid had been passed. Death occurred fifteen days later. Symptoms had existed two years before the tumour was noticed</p>	One nearly complete subsidence, without subsequent reappearance	The right kidney formed a very large cyst adherent by very firm and old adhesion to the liver, small intestines, and psoas muscle. This cyst contained three pints of milky fluid. The ureter was dilated, but not obstructed. The cyst had probably held about five or six quarts of fluid. The bladder contained nearly a pint of similar fluid. No microscopic or chemical examination of fluid made.	