ABSTRACT OF

An Address

ON

SOME OF THE ANATOMICAL ASSOCIATIONS
OF THE KIDNEYS, FROM A SURGICAL
POINT OF VIEW.*Delivered before the Cardiff Medical Society on June 6th, 1901,*BY EDMUND OWEN, F.R.C.S. ENG.,
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NERVE-ASSOCIATIONS OF THE KIDNEYS.

IN a large proportion of cases of renal disease the most prominent symptom is the subjective one of *pain*. At any rate, it is usually this which brings the patient to the surgeon, and makes the latter set to work to discover objective signs which may lead him to a correct conclusion as regards its cause. In speaking of the anatomical associations of the kidney, therefore, particular attention must be paid to the nerves, which not only associate the kidney with the neighbouring parts, but also keep the kidneys in harmonious working with each other. The nerves are derived from the sympathetic plexus in front of the upper part of the abdominal aorta, and into this plexus run branches of the splanchnics, the pneumogastrics, and also, indirectly, of the spinal nerves. These various filaments join in an entanglement from which the instruments of the most skilled dissector are unable to sort or to unravel them, and each abdominal viscus takes filaments from this interlacement according to its needs. Remembering that the testis was developed in close association with the kidney, it is not surprising that the nerves of the renal plexus are intimately connected with those of the spermatic plexus. And to this association of nerves is due the explanation of the pain in the testicle to which renal calculus often gives rise.

With an innervation-scheme in which medullated and sympathetic filaments are thrown with ganglia into a central pool from which each viscus helps itself, as it were, it can hardly be matter of surprise if the result does not always work out quite satisfactorily in a clinical sense. Of course, such an arrangement of nerve-tissue could not possibly suffice for supplying motor influences to the voluntary muscles of the body which have to contract with energy and precision, nor would it serve for the prompt and precise conveyance of sensory stimuli to the brain, but for quiet-going viscera in smooth working-order the scheme answers perfectly. Still, when disturbance arises in the affairs of any individual viscus, confusion is apt to occur, and errors of diagnosis and treatment are apt to ensue in consequence. Supposing that a calculus is forming in one kidney, a somewhat urgent and disquieting message is transmitted to the solar plexus. This is an unwonted occurrence, and the plexus is as unprepared for its reception and as incompetent to deal with it as, in somewhat similar circumstances, was that mixed department in Pall Mall known as the War Office. All is muddle and confusion; and when an explanation is demanded as to why and where the disturbance arose, and as to the precise cause of it, answer comes that it was on this side or on that side—it may be right and it may be wrong. In the clinical case which I am about to relate the answer was as incorrect as it could be:—

A healthy-looking man, 36 years of age, was admitted to St. Mary's Hospital on Oct. 7th, 1897. The notes say that he first felt dull pains in his back 10 years previously, and that about five years later he had a bad attack of renal colic on the left side; that he had several like attacks each year (which were always associated with vomiting), and that he had passed blood and many small calculi on various occasions. For the purpose of this paper, I wrote the other day to the patient for his own account, and this is what he said:—"These later attacks were very severe and always confined to the right side, and relief was only procurable by applying linseed poultices and turpentine to the back, and then to the front; the marks of which were on me when I

was examined." Yes, this was so: at the time of his admission the skin of the front and back of the right renal region was deeply stained by the marks of fomentations, and the patient was quite satisfied in his own mind that the small calculi, which he had passed from time to time, had come from the *right* kidney. Objective signs gave no help in the matter of localisation. On Oct. 13th the bladder was sounded, with a negative result, and a few days afterwards I explored the right kidney from behind, finding it larger than normal but otherwise healthy. The patient, a highly intelligent man, was, like myself, a good deal disappointed at this blank operation; but he promised to come into hospital again in a few weeks so that I might explore the other kidney. He was a bank clerk, and he fully understood that he had on this occasion, at any rate, made a mistake in his calculation.

Faithful to his promise, he came back towards the end of the following month, saying that since the operation he had been "perfectly comfortable," but that on one occasion he had passed some blood. On Nov. 29th I cut down upon the posterior surface of the *left* kidney, extracting a branching, coral-like calculus and several small calculi, and also evacuating a renal abscess of considerable size. The stone was phosphatic, and it weighed over 400 grains. Seeing how extensively this kidney was diseased, I hesitated whether I should take it away or not, but eventually decided to give it a chance. So I deluged its interior with hot sterilised water, and in this way washed out some more small stones. A drainage-tube was introduced into the kidney and the surface-wound was closed. Whilst in the hospital the man occasionally passed small calculi per urethram; his urine contained some pus, and at times a little blood. There was, moreover, constant leakage from a sinus which persisted in the loin. He left the hospital in January fairly well, except for the annoying sinus. This sinus continued to leak; so he came into the hospital again in February, 1898, in order that I might relieve him of that annoyance by removing the kidney. But when I examined him under an anæsthetic, and had explored the kidney with my finger, I had not the heart to perform the nephrectomy, as I found that a considerable amount of firm and apparently healthy tissue still remained. So I chased out a few more small stones, and determined to give the damaged organ yet another chance. The man stayed only a few days in hospital, and shortly afterwards resumed work at the bank, where he continued at business for a little over a year, the sinus oozing all the time into pads of absorbent dressings. To use his own words, "After the Easter holidays, 1898, I continued daily to travel up and down to the City, without a single exception, changing the bandage at midday, and on going to bed my wife used to thoroughly wash and irrigate the wound and to pass a probe down. I never became offensive, and I had fairly good health until April, 1899. Then I came to see you when you immediately operated, and removed the kidney, April 17th, 1899, after which the wound healed completely." He is now perfectly well, his large right kidney being quite up to the work thrown upon it—even after a 25-mile bicycle ride.

An interesting feature of this case is that though the man was working in a City office through the hot months his fellow-clerks never noticed any unpleasant odour; if an intelligent man with a renal fistula takes care of himself, his wound need not become septic or his leaking urine offensive.

I am well aware that it is not a very unusual occurrence for a surgeon to operate upon the wrong kidney in his search for a stone; but I do not think that a more conspicuous instance than this, of the untrustworthiness of the subjective symptom of *pain* in renal calculus, is likely to be forthcoming. Subjective signs are proverbially untrustworthy through the whole range of surgery; but in the case of the kidneys, which have drawn their nerves blindfold from the epigastric pool, it is small wonder if, in the absence of objective signs, patient and surgeon are sometimes led by them to make serious mistakes.

VASCULAR ASSOCIATIONS.

In one matter in particular the vascular associations of the kidney are important from a surgical as well as from a medical point of view. Let us take, for instance, the case of a man with old-standing stricture of the urethra, that is to say, a surgical case of damaged kidneys, or, if you will, a man with early Bright's disease—a sufficiently vague term. The kidneys are just able to do the amount of excretory work

which is demanded of them, but they have absolutely no reserve of physiological energy. The man indulges in a drinking bout, or, out at work, he gets wet through, and is suddenly attacked with sub-acute nephritis; and, perhaps, with complete suppression of urine. What is to be done for him? The intestinal canal and the skin are always ready to assist the kidneys if properly called upon, and, therefore, a full dose of calomel and jalap, and a hot-air bath may suffice to help the comatose patient over this very serious crisis. But there is something yet that may be done towards relieving the vascular engorgement of the kidneys and putting them in working order once more. The practitioners of bygone days would have resorted to venesection, and I am not sure that I should not do so myself, for I am a keen advocate for this "old-fashioned remedy out of date," as the late Dr. Hare called it. But the method to which I desire here to refer is the application of a score of leeches, or the efficient employment of wet or dry cupping over the loins.

If we take down from the dusty shelf the handbook of "Anatomy" which was so familiar to us in our student days—the only book in our old professional library, by the by, which has not become hopelessly out of date—we shall find (what we have never forgotten) that the kidney is supplied by the renal artery, and that the mass of the loins is supplied by the lumbar branches of the abdominal aorta. And from this brief description it might be taken as implied that the vascular systems of these two areas are separate and distinct. But if it were so, the application of leeches or cupping-glasses to the loins could have but very slight influence upon the renal engorgement. In his valuable work upon the "Arteries" which Robert Harrison published in Dublin in 1828, he specially called attention to the fact that the lumbar branches of the aorta helped in the supply of the kidneys—that is to say, that a free communication took place between the vessels of the abdominal wall and those of the abdominal viscera. Sir William Turner also, when a Demonstrator of Anatomy in the University of Edinburgh, did a great deal of work at this subject, publishing the results of his injections and dissections in the *British and Foreign Medico-Chirurgical Review* of 1863. He gives an account of the parietal and visceral anastomoses from diaphragm to perineum, but just now we are concerned with the scheme only so far as it affects the kidneys. The renal artery from the abdominal aorta having given the kidney all that it needs, sends branches through the fibrous capsule to join in an extensive anastomosis which the Edinburgh demonstrator named the sub-peritoneal arterial plexus. The chief vessels in this anastomosis of parietal with visceral arteries, are the phrenic and the lower intercostal arteries, and the upper lumbar branches of the aorta. Together with this arterial anastomosis there is, of course, a free communication between the venous plexus of the parietes and that of the kidney. And thus it comes about that the application of leeches or cupping-glasses to the loins, has an equally direct and important influence in the relief of renal engorgement. A knowledge of this piece of anatomy explains, moreover, how it is that a turpentine fomentation or a mustard plaster, by causing a dilatation of the surface-capillaries, and getting them filled from the renal vessels, thereby relieves the congestion of the kidneys, and produces a valuable diuretic effect.

ASSOCIATIONS WITH THE COLON.

I wonder if in Glamorganshire surgeons have ever met with such experience as that through which I have at times, unhappily, had to pass in London, of several of his cases, hospital cases and private cases, actually or apparently going wrong together? When clinical records, bedroom reports, thermometric charts and x-ray shadow-prints all seem to be pointing their fateful fingers at one and the same time! So far as my personal knowledge goes, I am apparently the only operating surgeon in London who has met with this experience; and I am heartily glad of it, for I would not wish my worst enemy to undergo it. The feeling, as I have experienced it, is such as to make a surgeon wonder if he did not, after all, commit a grievous error in the choice of his profession, and to induce him at once to throw it up. I ask if anyone in this part of the Principality has ever gone through such sad experience, because I am now amongst my Celtic congeners, and I think it just possible that the Celtic temperament may have something to do with so unhappy a state of affairs. Venturing to assume from your silence that at least one of you has known similar fits of depression in connexion with his professional work, I at once feel

less lonely; and, being thus enabled to speak in the first person plural, instead of as a solitary individual, I will ask if we are to explain the condition on the theory of the possible inheritance of some mysterious psychic legacy from an ancestral Druid of dyspeptic nature, who, becoming discredited in his profession because of his having persistently made wrong prognoses from the flight of the birds, or from the curl of the smoke of his sacrificial fires, fled despondent from his shady grove and turned his wasting energies perchance into the more honest and healthful paths of agriculture.

At any rate, just before the last period of the gathering of the sacred mistletoe, I was passing through such a time of trial as that just referred to, and when my cup of clinical misfortune seemed already full, I became associated with a peculiarly calamitous case, which I will report to you after I have made one more digression. Before relating it, I would ask how it is that in London the operative experience of almost every surgeon is apparently so extremely happy? The published reports of contemporary surgical practice seem to indicate an unvarying and almost monotonous record of success. Nevertheless, when I am reading some professional essay which is based upon a series of universally successful cases, which boldly conveys, or like an *Æsop's* fable ends up with a puffy *Moral*, I am now and then tempted to wonder if in the compilation of it the diplococcus of the imaginative faculty has not here and there been allowed to get the better of the germ of truth. But about this "germ of truth." It is strange how little we hear of it now, even in laboratory work. I understand that it is most difficult of cultivation; that it will not grow in hay-broth or gelatin, or upon fresh-cut slices of potato. So delicate is it that there is a risk of its altogether disappearing out of cultivation, like the beautiful pseudo-narcissus, or Tenby daffodil, that plant so dear to our illustrious friend Dr. Vachell, who, in the twenty-sixth volume of the Cardiff Naturalists' Society, tells us that this, our only native narcissus, which used to thrive so well in South Wales, has now almost entirely disappeared from the land it loved, by reason of the attacks made upon it by scientific and commercial botanical thieves, who came from London and other parts of the adjacent country of England in search of the precious bulbs. Let us hope, for the sake of the Principality, that the day may be far distant when English bacteriologists and other men of science will come to Wales in search of the few remaining specimens of the germ of Truth!

This is the case to which I was referring:—On the first day of last December I saw with my colleague Dr. Sidney Phillips a clergyman, 42 years of age, an unusually well-made, muscular man, who, except for a somewhat "worn" expression, looked as if he were in perfect health. This is the history that Dr. Phillips gave me of his case: "He has always enjoyed good health till the beginning of the spring of 1900, when he began to get pain in the back when bicycling. On July 3rd, 1900, he travelled by train to Llandudno from Northampton and experienced pain on the journey, and this became more severe in the evening. Since July he has been constantly in pain, but it has been most severe in the evenings and nights. About the 6th of October the pain became a good deal worse; he is doubtful if exercise brings it on, but he feels it more when he has had a railway journey. The pain goes into his left thigh and testis. He thinks that he has never had hæmaturia. The urine deposited phosphates with heat; there was no albumin in it or sugar. He used to weigh 13 stones, but on October 17th, 1900, his weight was only 12 stones 8 pounds. He had 'gravel' at the age of 25, and since then he has not held his water well, never going through a night without having to get up to pass urine. He does not think the frequency of micturition has become more marked of late." Dr. Phillips examined him under an anæsthetic on Oct. 17th, as he held his abdominal muscles so tense on the left flank that no deep palpation was possible; but nothing abnormal could be detected, neither fulness nor tumour. On Dec. 1st Dr. Phillips received a letter from the medical man who had been looking after him in the country in which it was stated that there had been blood in the urine on several occasions. The opinion of the medical man was that the cause of the trouble was renal calculus. When I examined him there seemed to be so much tenderness in the front and back of the lumbar region that I was not able to make a thorough exploration. The muscles were rigid and I could not thrust my fingers into the renal

region. The patient told me of pains running into the thigh and into the testis, and I also arrived at the conclusion that he probably had a stone in his left kidney. Accordingly, on Dec. 5th. in the presence of Dr. Phillips, I made an incision from the tip of the last rib to the outer border of the erector spinæ, but on cutting down to the posterior surface of the kidney I could detect no stone. I then loosened the connexions of the kidney and brought it out on to the surface, and still finding no stone I incised the outer border of the kidney and introduced my finger into the interior, but with a like negative result. Greatly disappointed, I closed the wound, inserting a gauze plug which passed into the interior of the kidney.

Subsequently to the operation the patient suffered considerably, so that several injections of morphia had to be given him. But although the appearance and surroundings of the wound remained perfectly healthy, his general condition caused great anxiety. He had no high temperature or shiverings to suggest that his failure to improve was due to septic causes, but he became more depressed and feeble day by day. Rectal stimulation was resorted to, as was also the intravenous injection of a hot saline solution; but all to no purpose. He died about midnight on Dec. 8th. On the afternoon of that day I was examining for the Bachelor of Surgery Degree of the London University, and during an interval in the examination I told my colleagues how a splendidly-developed man was slipping through my fingers after a disappointing operation for supposed renal calculus. My co-examiners were human and sympathetic, and one of them remarked that the unhappiness of a case of this sort is sometimes greatly softened by the disclosures of the post-mortem examination. And so it was here; for the necropsy revealed a small epithelioma growing into the interior of the descending colon at the level of the kidney, and secondary deposits in the liver, which were so hidden in the phrenic vault as not to be easily recognisable, though one of them was as large as a small cocoanut. "The kidney was found to be quite normal and only showed the incision of the operation."

Nec silet mors is the motto of the pathologists; and certainly the information which Death vouchsafed on this occasion, that a splendid-looking fellow had died from cancer and not from the results of an operation for a renal calculus which did not exist, was most welcome to everyone concerned!

From a surgical point of view, the most important of the anterior relations of the kidneys is certainly the large intestine—the ascending part of the colon lying in front of the right kidney, and the descending part in front of the left.

On New Year's Day of 1895, a man, aged 55 years, was admitted into the Thistlethwayte Ward of St. Mary's Hospital. He looked very worn and ill, and he remarked that he had lost four stones in weight during the past three years. He said that his troubles began about four years ago with a dull, dragging pain in the right loin, which sometimes extended across the abdomen, but generally shot down into the right groin. The pain came and went irregularly, lasting six or ten minutes and disappearing completely between the attacks. He had steadily got worse, and a little more than a year ago he went into a large London hospital, where the surgeon, under whose care he was, told him that his distress was due to the fact that he had a "floating kidney," and that it ought to be cut down upon and stitched in its proper place. To this operation he said he submitted, and a long, linear scar running obliquely over his right lumbar region seemed to confirm this statement. The man further said that the very day after that operation he had recurrence of his old pains as severely as ever, and that on informing his surgeon of this, he had received the explanation that the "kidney must have broken loose again." From that moment it was recognised that the operation had produced no improvement whatever. On the other hand, the pains, which were steadily increasing up to the time of the operation upon the kidney, continued to increase subsequently, so that when he applied for admission to St. Mary's Hospital he compared them to "a thousand knives." He had also been troubled with loose, blood-stained actions of the bowels. On examination, a circumscribed tumour could be felt deeply in the region of the ascending colon, well above the level of the cæcum. It was hard and tender, and was evidently the starting-point of all his pains. Whilst examining this mass, it was noticed that distended pieces of intestine in the neighbourhood were struggling to rid themselves of a collection of gas which was apparently divided up into hard, ball-like masses. Indeed, so vigorously was the peristaltic action

being carried on, that the gas was locked up in the segments of the bowel under such tension as to convey, at a first touch, the idea of the balls being solid. But they were resonant on percussion, and they presently changed their position or disappeared altogether. The man was given to understand that in all probability he had a cancerous mass which was blocking his bowel, and that though, possibly, it could not be removed, still some operation might be performed with the view of getting the contents of the bowel beyond the blockage, or of securing for them an easy and painless outflow.

On Jan. 4th, therefore, a free incision was made through the right semilunar line, and a hard mass of the size of the fist was found in the colon as it ascended in the renal region. I proposed short-circuiting the ileum with the colon beyond the obstruction, but on one of my colleagues urging that this could afford the patient but brief or imperfect relief, I resected the cancerous bowel and connected the divided ends of the colon by a Murphy's button. The growth proved to be a columnar epithelioma which almost entirely blocked the passage. Below the obstruction the muscular wall of the intestine was greatly thickened, with the design of forcing onwards the liquid and gaseous contents. Unfortunately the man died. On the evening before his death there was a slight escape of feculent fluid from the wound, and the conclusion formed was that the splice was not watertight. At the post-mortem examination it was found that a perforation had occurred upon the distal side of the bowel, where the thin intestinal wall had pressed against the edge of the button. The man had been so weak, however, when the discharge was noticed, that it was not considered practicable to open up the wound and examine for the seat of the leakage.

Having told you that this case ended fatally because of the edge of the metal button causing a perforation of the bowel (for the occurrence of which I readily accept the blame) it is obvious that I do not cite this report with any thought of building up a surgical reputation. Nor do I cite it with the idea of making any invidious reflection upon the surgeon who, about a twelvemonth previously, had mistaken carcinoma of the ascending colon for a moveable kidney. But I bring it forth from the clinical treasury because it so well illustrates my Paper.

A Clinical Lecture

ON

RETENTION OF URINE.

Delivered at University College Hospital on May 20th, 1901,

By CHRISTOPHER HEATH, F.R.C.S. ENG.,

CONSULTING SURGEON TO THE HOSPITAL AND EMERITUS PROFESSOR OF CLINICAL SURGERY.

GENTLEMEN,—I am going to speak to you this afternoon on a disorder which must be interesting to every medical man and of which you may very likely have to treat cases directly you enter upon practice. By retention of urine is meant a condition in which the bladder does not extrude its contents. I do not intend to-day to speak about the kidney; I am confining my attention to retention of urine by the bladder, and it will be convenient to consider the male bladder first of all and to speak of it at different ages.

In children you occasionally meet with retention from a tight foreskin. When this occurs, the infant very soon after birth is noticed not to be passing urine or only very little, and possibly the foreskin is what is termed "ballooned." The treatment is simply to dilate the orifice with a pair of forceps, or, if you choose you may circumcise the child; but, in my opinion, dilating the orifice does just as well and an "operation" is avoided. Later in life a child, if it does not pass urine, may have a calculus in the urethra. Calculi are formed, as we know, even before birth, and occasionally a small uric acid calculus passes into the urethra and becomes fixed there. The narrowest point of the urethra is at the meatus, and you may anticipate that the stone if it lodges at all will be found near the meatus. I remember a case which was brought here by a medical man,