CLINICAL REMARKS ON THE SYMPTOMS AND CONDITIONS WHICH JUSTIFY NEPHROLITHOTOMY,

THE CHIEF CONDITIONS SIMULATING RENAL CALCULUS, AND
SOME PRACTICAL POINTS IN THE OPERATION OF
NEPHROLITHOTOMY.¹

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In explanation of the choice of my subject I am very strongly of opinion that nephrolithotomy is one of those advances in modern surgery in which the operation has outstripped the diagnosis. What with the pitch of excellence to which our anæsthetics, our instruments, and the aseptic precautions both during and after the operation have been brought, what with the comparative simplicity of the viscous which we attack, and its, as a rule, uncomplicated surroundings, the operation of nephrolithotomy has been rapidly perfected, while the diagnosis, unhappily, often lags behind. To speak only from my own experience, I would say at once that, while I have seven times removed calculi by nephrolithotomy, several of which are before you, I have on five occasions explored kidneys for stone both by multiple puncture and by incision without result. These five cases must be mentioned. The first was lithic acid in a hypochondriac, who greatly exaggerated his symptoms and who, having heard of nephrolithotomy, asked for the operation. Both Dr. Pye-Smith, whose patient he was originally, and I were very doubtful about the existence of a calculus. After the operation his pain was lost with suspicious rapidity, and he remained well when seen last, seven months later. The second was a case of movable kidney, becoming painful after gonorrhoea, which perhaps set up slight pyelitis. The third was a case of malignant disease around the last dorsal nerve. These cases are more fully alluded to later on. The fourth was a case of granular kidney. This was a patient, aged 61, with constant hæmaturia and left lumbar pain. As the specific gravity of the urine did not exceed 1012, I contented myself with exploring the kidney with a needle, after it had been exposed. Bronchitis, running into bronchopneumonia, largely due to foggy days, carried off this patient on the fourth day. The kidneys were granular, the left especially so. I should have acted much more wisely if I had watched this patient longer, but the hæmaturia had baffled much painstaking on the part of the medical man who sent him to me, and I attached far too much importance to uric acid crystals in the urine. This occurred to me before the papers of Dr. West and Mr. Bowlby, to which reference is made later, had appeared. The fifth case was, I believe, in the light of a larger experience, very early tubercular disease.

Mr. H. Morris, in his address before the Medical Society in 1885, said he knew of fifteen cases more or less typically indicative of renal calculus in which an exploratory operation failed to find a stone. I have strong reason to believe that, while every successful case of nephrolithotomy is usually published, a large number of unsuccessful explorations are never heard of.

With this conviction, that the operation for the removal of a renal calculus has become a simpler matter than the diagnosis of their existence, I venture to bring before you the following points, all of them of much importance in the treatment of renal calculus, which form the heading of my paper.

A.—THE SYMPTOMS AND CONDITIONS WHICH JUSTIFY NEPHROLITHOTOMY.

1. Continued hæmaturia or passage of blood and pus. 2. Pain or tenderness in the loin and elsewhere. 3. Points connected with the previous history, for example, family history, *habitat*, habits, lithiasis, oxaluria, passage of previous stones, renal colic. 4. Frequency of micturition. 5. Absence of any condition in the

rest of the urino-genital tract to explain the symptoms (Morris).
6. Failure of previous treatment.

1. *Continued Hæmaturia or Passage of Blood and Pus.*—I may at once be criticised for putting this first; and, indeed, it is somewhat difficult to decide which symptom of renal calculus is clinically the most important. On the whole, I am inclined to agree with an old friend, G. A. Wright, of Manchester,² who considers "renal hæmaturia as the only single symptom of anything like cardinal importance," if of more than a year's standing, without evidence of nephritis, and if without a coexisting renal swelling.

A few words as to the character of the hæmaturia of renal calculus and the fallacies which must be borne in mind. It is a hæmaturia of long standing, often repeated, frequently increased by exercise, rarely profuse, and never producing anæmia, as in growth of the kidney. Always intimately mixed with the urine, its tint varies from a bright or deep red (which I think are rare) to a smoky or porter-like colour.

Fallacies: (a) Hæmaturia may be absent from first to last. This, an undoubted fact, is one very difficult of explanation. It was the case with this calculus which I removed from a man aged 22. And this is the more extraordinary, as you will find that the stone is covered with minute crystalline spicules, a condition which would have appeared certain to lead to oozing from the inflamed mucous membrane of the pelvis in which this stone lay. The only explanation that I can give is that at the operation I found the abdominal muscles extremely rigid; even when the patient was fully anæsthetised they gave the impression to the scalpel of cutting through tissues frozen by ether. Now, if it is fair to suppose that on the other side of the kidney the quadratus and psoas were as firmly contracted, the kidney and the stone in its pelvis may have been so firmly held that no irritation by the calculus could take place, and thus no hæmaturia.

(b) Another fallacy is that the hæmaturia of calculus may be only temporary, present for a while and then cease altogether. This occurs, though rarely, when a small renal calculus becomes encysted.³

(c) The value of hæmaturia, though only occasional, is shown by a case of Dr. Owen Rees, to which Mr. Morris has drawn attention. It was that of a young lady with lumbar pains and frequent micturition, which were both put down to the hysteria which was markedly present. After a while, hæmaturia was found to be present on several occasions, and eventually, after death, a mulberry calculus was found in one kidney.

Other fallacies are presented by the host of kidney conditions which may give rise to hæmaturia, namely, (1) the passage of uric acid crystals; (2) tubercular kidney; (3) granular kidney; (4) growths; (5) increased intrarenal pressure, etc. To these I shall refer later.

2. *Pain and Tenderness, Lumbar and Elsewhere.*—(a) *Fixed Lumbar Pain.* Characters: Usually dull, gnawing, pricking or aching, increased usually by exercise, twisting from side to side, or flexing the body. Sometimes it is relieved by pressure of the hand, leading to thickening and vascularity of the parts when they are incised at the operation.

(b) *Radiating Pain*, for example, in the testis, region of the small sciatic nerve, calf, foot, or in the intestine simulating colic. It is easy to see how readily the pain of a renal calculus, if limited to distant parts, and if occurring without hæmaturia, may mislead.

Another point with regard to the pain of renal calculus is the frequency of nocturnal exacerbations. The explanation of this is doubtful, whether, as Mr. Morris has suggested, from the passage of flatus in the colon, at this time over a stone in the pelvis, or, as I venture to think more probable, as accounting for stone both in the pelvis and in one of the calyces, to the concentration of the urine, and consequent deposit of crystals, which takes place at night, is unsettled. The fact, however, is undoubted. In the case of a patient, aged 58, who had suffered from symptoms of renal calculus for thirty years, and from whose left kidney I removed this huge calculus, the pain at night was often so severe as to drive him from his bed into his garden or the streets of the town in which he lived.

² *Medical Chronicle*, March, 1887, p. 463.

³ Dr. Church, *Path. Soc. Trans.*, vol. xx, p. 239. A calculus of oxalate of lime, weighing 953 grains, removed from the body of a woman about 35, was situated in a pouch almost completely shut off from the pelvis of the kidney. The kidney did not appear to have suffered from the presence of the stone. For many years no renal symptoms had existed, but when a child the woman had made frequent complaints of pain and tenderness in the lumbar region.

¹ Read at the Newport meeting of the South Wales Branch of the Association.

With regard to tenderness, Mr. Jordan Lloyd,⁴ in a paper to which I shall have again to refer, writes thus: "I attach great importance to the evidence to be obtained by immediate percussion over the suspected organ, a method of investigation which has not received that amount of attention to which it is entitled. It is best practised from the loin, just beneath the space between the tips of the last two ribs, and should be made in a direction upwards, forwards, and slightly inwards. It is best for the patient to stand upright before you. The blow should be sharp and decisive, and of force sufficient to affect a structure situated several inches below the surface. It may also be practised from the front, at a point midway between the umbilicus and ninth rib. When a calculus is present, the patient will complain of sharp, stabbing pain at the moment of percussion. Other conditions doubtless give rise to percussion pain, but not of the characteristic stabbing of calculus."

Having only become acquainted with these remarks the other day, I have had but one opportunity of testing Mr. Lloyd's statement. It is that of a man, aged 56, with all the symptoms of a stone in the left renal pelvis. While percussion on the right side elicited nothing unusual, when it was practised on the left the patient said, without any leading questions, "you stab me there."⁵

3. *Points in the Previous History.*—Time will only allow of my noticing a few of those given above, namely, lithiasis and oxaluria, history of a previous stone, history of previous colic.

The history of long-standing lithiasis and oxaluria is of obvious importance, from the fact that the habitual passage of crystals or gravel and the formation of a calculus lie not far apart. But there is another point which has not, I think, received sufficient attention, and that is that in patients who have habitually, for many years, passed uric acid and oxalate of lime, there is a most serious risk that the minute anatomy of their kidneys will have become seriously damaged by the constant presence of the above crystals. We should all be agreed as to the damaging effect of multiple calculi on the secreting tissue of the kidney. I would suggest that in the future the results on the kidney of the daily passage of crystals of uric acid and lime oxalate must receive sufficient attention before patients at all advanced in life are submitted to nephrolithotomy. Furthermore, it is obvious that long-continued lithiasis and oxaluria will very likely have led to the formation of bilateral stones.

With regard to the passage of a previous stone, I believe it to be a clinical fact that if an intelligent patient, with symptoms of renal calculus, has never passed gravel, this points to the existence of a small single calculus. Again, the passage of numerous, even very numerous, small calculi does not by itself point to a condition requiring nephrolithotomy. I still see, occasionally, a man, aged 69, who has passed in his lifetime 218 small calculi; 78 of these have come away during the last twelve months, chiefly, I think, from his taking my advice and drinking daily two quarts of filtered and boiled Thames water, close to the banks of which he lives. He is hale, vigorous, and cheery, and it is difficult to see how nephrolithotomy could have bettered his condition, if performed forty years ago.

Under the heading of Renal Colic, I would point out that the vomiting and nausea which are thought to be characteristic of the agony of a descending calculus may also be caused by a stone which is distending the renal pelvis, and which has not yet begun to make its way down.

4. *Frequency of Micturition.*—The coexistence of irritability of the bladder with renal calculus is well known, and may be explained either by nerve disturbance, or by the blood and pus, or the over acid urine which often accompanies stone in the kidney.

I have only time to draw attention to two points: (1) We all know that it is to the pelvis and hilum that the nerves are most freely distributed, and that it is this part of the kidney which is most closely associated with the bladder. A point on which I seek information is this. If a patient has renal calculus and no bladder irritability, does the absence of this symptom point to the stone being in one of the calyces and not in the pelvis of the kidney? The importance of this distinction, if it be one, will be recognised by anyone who has performed nephrolithotomy. A question always arises before the operation, namely, Where shall I find the stone, in the kidney itself or in its pelvis? A stone in the pelvis is, as a rule, easily found and removed. A stone in the

tissue of the kidney, even if near the surface, is much more difficult to find, while one embedded in a deeply lying calyx may be overlooked, as in Mr. Morris's well known case.⁶

(2) The other point with regard to bladder irritability is that it may be of value in making that most difficult diagnosis between calculous and tubercular kidney. Thus if a patient with hæmaturia, lumbar pain, etc., has irritability of the bladder which is not relieved by rest in bed, which continues by night as well as by day, it is probable that this is due not to trouble in the kidney alone, but to coexisting ulceration of the bladder, probably confirmed by examination of the prostate and vesiculæ seminales in the male, and by digital exploration of the bladder in the female.

5. *Absence of any Condition in the rest of the Genito-urinary Tract which will explain the Symptoms* (Morris).

6. *Failure of Previous Treatment to give Relief.*—I can only touch on two points here. The first, the question of the advisability of trying to exert any solvent action on a calculus in the kidney. Whilst, for myself, I attach the greatest importance to the use of large quantities of water, it is rather because this, by washing out the kidneys, removes collections of crystals, and gets the patient into a better state for operation, than because I believe in its possessing any actively solvent action upon the calculus. I do not forget that Dr. Roberts has proved by experiments on calculi, both those without the body and those in the bladder, that urine rendered alkaline by fixed alkali has a distinctly solvent action. Dr. Ralfe has reported a case⁷ of a patient, aged 37, who, after suffering from uric acid gravel for some years, had a violent attack of renal colic, with profuse hæmaturia, no calculus or gravel being discharged. Alkaline treatment was at once resorted to, and for a time afforded relief, but the patient could not be persuaded to continue it systematically. He was then ordered to drink copiously of soft water—filtered rain water. Two years later he began to pass grit and scales of calculous matter with his urine; and shortly afterwards, after a severe attack of colic, he passed the shell of what had evidently been a solid calculus.⁸

But it must be remembered that, as my late colleague Dr. Hilton Fagge pointed out,⁹ such solvent treatment is only worth trying in the case of uric acid calculi. He at the same time showed that the greater relative frequency of lime oxalate calculi over those of uric acid, especially in patients after early adult life, is much more marked than is generally believed. Another point on which I seek information is, how far belladonna and opium are of any use in promoting relaxation of the ureter fibres when a stone has left the pelvis and is very slowly making its way down the ureter?

I pass on to the second part of my paper.

B. THE CHIEF CONDITIONS SIMULATING RENAL CALCULUS.

These are: (1) Lithiasis, and, to a less degree, oxaluria; (2) tubercular kidney; (3) pyelitis, not tubercular; (4) movable and (5) aching kidney, especially if associated with (6) neuralgic conditions; (7) disease in organs contiguous to the kidney; (8) disease of lumbar spine; (9) interstitial shrinking nephritis; (10) malignant disease of the kidney, especially of its pelvis and malignant disease around last dorsal nerve.

1. *Lithiasis.*—I have already alluded to this condition, as one which simulates renal calculus by the hæmaturia which crystals of uric acid may cause. Lumbar and testicular pains are also points which mere lithiasis shares with renal calculus. The diagnosis will not be difficult by watching the result of treatment which only gives relief in the one, but clears up the other. Exercise, again, is a test. A patient with renal calculus, who declines or is unsuited for operative treatment, is often much crippled in carrying out palliative treatment, and made worse by the exercise which is otherwise so essential to him.

⁶ *Med. Chir. Trans.* vol. lxxviii.

⁷ *Path. Soc. Trans.* vol. xxxiii. p. 206.

⁸ Dr. Ralfe (*Diseases of the Kidneys*, p. 523) points out that "the solvent action of distilled water is due to several influences. In the first place, by causing a low specific gravity of the urine, it induces disintegration, since Rainey has shown experimentally that bodies placed in solutions of different density to those in which they were formed undergo molecular disintegration. Again, chemical analysis has shown that those calculi that undergo spontaneous disintegration are always poor in inorganic constituents, the use of soft water diminishes the supply of these, even if it does not actually act as a solvent on those forming the outer crust of the calculus, and so increases the tendency to disintegration. Lastly, soft water probably diminishes the catarrh of the urinary passages, and by diminishing the swelling of the mucous membrane allows a small stone to pass which was before obstructed."

⁹ *Medicine*, vol. ii, pp. 373, 383.

⁴ *Practitioner*, vol. xxxix, p. 178.

⁵ Four days later I performed nephrolithotomy, and removed a small hedgehog-oxalate of lime calculus from the top of the left ureter.

2. *Tubercular Kidney*.—Lumbar pain and tenderness, frequent micturition, hæmaturia, are all common to tubercular kidney and renal calculus. The chief aids in the diagnosis appear to me to be: (a) the pyuria; (b) careful examination of the urine; (c) early pyrexia; (d) early exploration of the kidney.

a. *Pyuria*.—This is usually present early in the case with a proportionate amount of albumen, without much hæmaturia, the blood often occurring only as a thin layer over the pus at the bottom of the urine glass, or as small thready clots. With all the pus the urine is strongly acid at first, then more feebly so, but often remains slightly acid to the last.

b. *Careful Examinations of the Urine*.—The sediment contains caseous matter, and sometimes *débris* of connective tissue can be made out, a point of much importance. Finally, there is the bacillus tuberculosus. While I am well aware of the frequent want of success in demonstrating the presence of the bacillus in urine as in bone, I may add that it was found in three out of the eight cases in which I have been asked to explore tubercular kidney.

c. *Pyrexia*.—I do not here speak of the hectic which accompanies the advanced stage, but of the pyrexia which may be an important factor in the diagnosis much earlier in the case. Often intermittent at first, and liable to be overlooked in the anorexia, nausea, and debility which accompany it, later on, and too late, it becomes only too evident and confirmed.

d. *Early Exploration of the Kidney*.—I would most strongly urge this step, with a twofold object: (1) to clear up the case, and (2) to perform nephrectomy if the kidney is found to be the site of so fatal a disease. If I am told of the unwisdom of this step, owing to the probability of both kidneys being affected, I would reply that, as a rule, both kidneys are not affected at an early stage. Thus Dr. Fagge¹⁰ gives a list of thirteen cases which show "the characters of tuberculous disease of the kidney at its commencement." In only three of these were both kidneys affected, and in all these tubercular mischief was present in the bladder also. If during this early exploration one or two pyelitic dilations are found, extirpation of the kidney should be performed while the organ is still small and movable, and before the rest of the genito-urinary tract becomes involved.

I need not remind my hearers of the miseries which lie before a patient with established tubercular kidney, the results of ulceration of his bladder, with, perhaps, vomice in his prostate, and the inevitable course downhill—arrested, it may be, for a little while by nephrotomy and drainage.

My own experience of nephrotomy in established tubercular kidney is most unfavourable, the relief being slight and short-lived, and not arresting long the hectic and increasing debility. On the other hand, in two cases in which I have been able to perform nephrectomy early the result has been very satisfactory. One, a very frail woman, aged 40, operated on two years and a half ago, has remained free from tubercular trouble since; the other, a young man, operated on eleven months ago, has been able to complete his terms at Cambridge, and to take a curacy near Ipswich.

3. *Slight Pyelitis, not Tubercular*.—This condition may by hæmaturia, pus in the urine, lumbar and testicular pain, simulate renal calculus closely. It may follow a gonorrhœa, perhaps a previous stone, or occur in women after pregnancy; probably, as Dr. M. Duncan thinks, from some parametritis extending up the psoas to the perirenal fat and kidney. Five months ago I explored the kidney of a collier from this town, whose life was made wearisome by constant aching in the right loin and testicle, gradually coming on after gonorrhœa. The urine contained no blood, but persistent oxalate of lime crystals, not removed by treatment. On examination of the kidney, both by multiple puncture and by incising the organ near its pelvis, so as to explore this and the adjacent calyces; the pelvis seemed dilated, and the kidney itself was distinctly "movable." It was accordingly sutured. The wound soundly healed, and during the five months in which he was kept under observation there has been no return of the pain. Whether this case was one of pyelitis after a gonorrhœa, or an early tubercular kidney, must remain undecided.

4. *Movable Kidney*, especially if associated with neuralgia, pyelitis, or if occurring with some of the reflex causes of nephralgia to be mentioned below.

5. *Aching Kidney*.—Under this title Dr. M. Duncan has described a condition, especially common in women, which may simulate

renal calculus. Its chief features are a heavy wearying pain deep in the side, usually accompanied by tenderness, often great; the pain often runs in the course of the great sciatic or anterior crural, and is often accompanied by irritability of the bladder, and, frequently, by pain in the course of the ureter. The disease is liable to be aggravated by exercise. The chief points in the diagnosis of this condition are, Dr. Duncan points out, the absence of blood and pus, the fact that the "aching" often occurs only at the menstrual periods and is always worse then, from the intimate connection between the kidneys and the generative organs, not only developmental but pathological.

6. *Nephralgia Due to Disease in Parts adjacent to the Kidney*.—Dr. Ralfe¹¹ gives some of these; one, he thinks, is duodenal ulcer. Thus, a patient had many symptoms of renal colic, and three attacks of paroxysmal pain accompanied by vomiting, great tenderness in the right renal region, urine loaded with uric acid, but no pus or blood. The patient, who was losing flesh, recovered with treatment directed to duodenal ulcer. The same writer gives another interesting instance of intestinal irritation simulating nephralgia by causing severe pain in the right hypochondriac region. The patient was treated for biliary colic, and a few days later, instead of a gall stone, a large round worm was passed, giving relief to the pain.

7. *Gall Stones retained in the Gall Bladder* may be taken for right renal calculus. Dr. Murchison pointed out long ago that they not infrequently coexist. My old friend, G. A. Wright, of Manchester, has recorded a case¹² in which the right kidney was explored for a calculus believed to be in the ureter. On exploring this tube a hard spot was felt near the brim of the pelvis, and taken for a stone in the ureter. A calculus the size of a pigeon's egg was removed and found to be a gall stone. Acute peritonitis carried off the patient, and a stone was found to exist in the pelvis of the right kidney, with its apex in the ureter.

While on the subject of nephralgia due to conditions of viscera near the kidney, I may refer to some remarks of Mr. Godlee¹³ in which he insists that repeated attacks of intestinal colic, especially if accompanied by nausea, may be the only symptoms of the presence of either a renal or biliary calculus, and that this fact should lead the practitioner to investigate the state of the kidney and urine, bearing in mind the possibility of the symptoms being due to renal or biliary calculi.

8. *Spinal Disease*.—The great difficulty which may arise in diagnosing between certain cases of spinal caries and renal calculus is not yet sufficiently recognised. A writer, already quoted from (G. A. Wright),¹⁴ thus alludes to this matter. "Where a local patch of caries of a vertebral body exists, and especially where deep suppuration occurs and presses upon the kidney, as in a case of my own and one or two others which I have seen, nearly all the symptoms of a calculus have been present. In my own case, without any deformity or tenderness of the spine, there was unilateral rigidity, testicular pain, intermission of symptoms, increased frequency of micturition, nausea during attacks, and oxaluria with local pain and tenderness. Subsequently an abscess developed, and on exploration a small patch of caries was found, and the kidney was felt exposed in the anterior wall of the abscess cavity. Probably, as in floating kidney, obstruction of the vessels and ureter may arise and cause symptoms, so that pressure of the spinal abscess may disturb the kidney and quite possibly give rise to hæmaturia."

9. *Interstitial Shrinking Nephritis*.—This condition may simulate renal calculus both by hæmaturia and pain. Dr. S. West¹⁵ drew attention to the hæmaturia which may accompany granular kidney, and published three cases, aged 21, 19, and 24; in the first the hæmorrhage was profuse. Mr. Bowlby¹⁶ also published three cases, aged 73, 49, and 64; two of these died, and the kidneys were found markedly granular. He points out the following as distinguishing this condition from renal calculus. The specific gravity of the urine, after the blood has cleared up, only 1008 to 1015; tortuous arteries, cardiac hypertrophy, and high arterial tension; blurred, ill-defined discs, some retinitis and effusion amongst the blood vessels. The paper concludes with the following warning: "Unless it be recognised that blood may emanate from a kidney which is simply granular, operations may be undertaken for the removal of renal calculus."

¹¹ JOURNAL, 1888, i, p. 183.

¹² Lancet, 1885, i, 563.

¹³ Practitioner, xxxix, p. 246.

¹⁴ Med. Chron., No. 6, p. 642.

¹⁵ Lancet, 1885, ii, 104.

¹⁶ Clin. Soc. Trans., xx, 14.

I have only time just to mention two other conditions which may simulate renal calculus; they are:—

10. *Growth of the Kidney in its Early Stage, and Malignant Disease, involving the last Dorsal Nerve.*—I have not had sufficient space for the quotation of cases; but I may briefly allude to one here which shows how closely the presence of renal calculus may be simulated, and how misleading evidence may be. Four years ago a patient, aged 44, came under my care with hæmaturia, wearing pain, tenderness in the right loin and thigh, and oxaluria. His childhood had been passed in Norfolk, and as a lad he had been cut by Mr. Birkett for stone in the bladder. I sounded him twice, and finding no stone, I swept the sound in contact with the bladder in different directions, in the hope of detaching fragments of growth, if one were present. No relief being given by drugs, I explored the right kidney, and could find nothing abnormal. Four days after the operation, while all seemed to be doing well, the patient died very suddenly. The *post-mortem* examination showed (1) a primary carcinomatous growth in the bladder of a somewhat unusual kind; it involved the apex, as a flocculent, superficially-ulcerated area; (2) a ring of secondary deposit surrounding the last dorsal nerve, just at its exit from the spine; (3) a mass of enlarged glands around the inferior cava, and at one spot sprouting into it.

C. CHIEF PRACTICAL POINTS IN THE PERFORMANCE OF NEPHROLITHOTOMY.

1. To count the ribs. That this is not an unimportant detail is proved by the fact that Prof. Dumreicher, of Vienna,¹⁷ accidentally opened the pleural cavity in an attempt to remove a pyelo-nephrotic calculous kidney. *Post mortem*, the last rib was found to be rudimentary, and the pleura projected a good deal below the lower edge of the eleventh rib.

2. To make a sufficiently free incision, especially in a stout patient, and a deep loin. Additional room may be gained by converting the usual lumbar incision into a T-shaped one, or by making use of König's incision, in which the muscles are cut through as far as the rectus, and the peritoneum pushed forwards. A small stone in a kidney will always be liable to be overlooked, but a surgeon does not give his patient or himself a fair chance who is content with exposing the kidney through a limited incision, and then trusting to punctures with a needle.

3. To pack away with sponges the colon, which is often troublesome distended with flatus in these cases.

4. If the stone cannot be felt either in the pelvis or after palpation of the posterior and anterior surfaces of the kidney, this should be drawn up and out of the wound as far as possible, and again examined, a careful watch being kept upon the pulse.

5. In puncturing the kidney, to try, as far as possible, to open the calyces systematically.

6. If palpation and acupuncture fail to find a stone, the kidney should be carefully opened and sounded. I will recur to the subject of hæmorrhage shortly, and take first the best site of opening the kidney. Hitherto in five doubtful cases I have incised near the pelvis, as the viscus is thinner here, and as the surgeon can better reach the calyces. Mr. Jordan Lloyd, however, recommends the following method of exploring the interior of a normal kidney:¹⁸ "When the kidney is exposed through a lumbar wound I puncture its lower end with a long-bladed tenotome in a direction upwards and inwards, making for the lowest of the calyces. If the surgeon is observant and his knife is keen he will readily appreciate the moment when a cavity is struck by the altered resistance offered to the puncturing instrument..... It is important, because a tenotome may be pushed up to its handle in a normal kidney without tapping its interior cavity, having travelled *along* the kidney substance rather than *through* it. Into this opening I pass a child's bladder sound, and systematically explore the whole of the pelvis." It is advised that the blade should be not more than one-third of an inch in length, a stem of about 7 inches, and the size of a No. 3 English catheter. It should be passed at once to the top of the kidney cavity, a distance of nearly 4 inches, and the exploration should be carried out systematically from above downwards, the point being rotated in all directions, so as to investigate both tubes and calyces as the instrument is withdrawn. In this manner Mr. Jordan Lloyd has

succeeded in finding a calculus, after needling and palpation had been assiduously tried with negative results.¹⁹

7. Hæmorrhage from an incision into the kidney is certainly arrested by firm, careful plugging with strips of sal alembroth gauze. On the five occasions on which I have used this plan I have removed the strips the next day with the aid of a few minutes' anæsthetic, gas sufficing for this. It is said that this plugging may cause vomiting. This did not occur in any of my cases. It ceases on the removal of the plugs. Care must be taken that the plugging is thoroughly done. If inadequate it will have to be repeated in a few hours—perhaps more than once—thus leading to exhaustion and setting up cellulitis, which may of itself be fatal, owing to the important relations of the kidney.

8. Sources of difficulty in removing the stone.²⁰ The chief of these are: (1) A very mobile kidney, which gets away deep in the wound; (2) a stone situated on the anterior surface and near the entrance of the vessels; (3) a small stone in a sacculated kidney, the stone falling into one of the sacculi, and thus being hard to find.

9. Multiple calculus in a suppurating, damaged kidney. If the question of nephrectomy arise this step should, as a rule, be deferred, and the kidney thoroughly drained, for (1) additional shock and loss of blood will be avoided. (2) The condition of the opposite kidney, very possibly calculous also, will be made clearer by waiting. (3) The bulk of the kidney will be lessened by drainage. (4) Though a source of discomfort (if an open sinus persist) it may still do some and important work.

10. If the kidney has been much disturbed it should be stitched *in situ*.

LECTURES ON THE SURGICAL ASPECT OF HEPATIC ABSCESS.

Delivered at the Hospital for Consumption and Diseases of the Chest, Brompton.

By RICKMAN J. GODLEE, M.S., F.R.C.S.,

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LECTURE II.

It will now be convenient to give a few typical examples of tropical abscess, it being understood that it is difficult to meet with a case which does not present some special peculiarity.

CASE X.—Lieut. H., age 26, invalided home from India with threatening liver abscess, was seen by Sir Joseph Fayrer some months before he came under my care. He was put under treatment and much improved, so that he considered himself well enough to take open-air exercise, hunting, and so forth. On returning to show himself, it was found that he had an abscess pointing at the epigastrium, over which the skin was slightly reddened. There was great tenderness at the epigastrium, and some over the lower ribs in the axilla. He was strong, well-built, and well nourished, but with the characteristic dirty yellow complexion described above.

I opened the abscess in the epigastrium, finding plentiful adhesions, on February 5th, 1884, letting out 4 to 6 ounces of yellow pus. The discharge in this case assumed the characters I have just described: thin serum and dark red muco-pus. It gradually diminished, and the abscess was completely closed by March 11th.

¹⁹ The same paper contains very helpful remarks on the nature of the kidney pelvis. I have only space for a few of them. Failure to find a stone when present "depends mainly on two points: First, an inaccurate conception of the precise nature of a kidney pelvis, and, secondly, the faulty methods adopted for the examination of the kidney's interior..... Instead of the pelvis being a funnel-shaped membranous sac it really consists of a cluster of branching tubes, so that the procedure of exploring the kidney's interior by means of a finger introduced into the pelvis through an opening in the kidney substance is practicable only in dilated kidneys, and is absolutely impossible when we are examining the interior of the viscus in anything approaching a normal condition. I have not yet found a healthy human kidney into the primary pelvis tubes of which I could introduce my index finger."

²⁰ The various positions which calculi may occupy in the kidney and the precautions demanded in dealing with them have, very recently (JOURNAL, November 16th, 1889), been fully dealt with by Mr. H. Morris. His remarks will repay most careful attention.

¹⁷ See a paper by Dr. Lange, of New York (*Ann. of Surgery*, October, 1889), in which he calls attention to the investigations of Dr. Holl on this matter.

¹⁸ *Pract.*, xxxix, 173.