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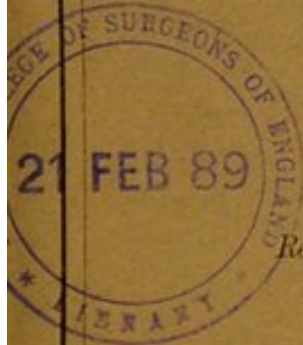
ON THE

SURGERY OF THE KIDNEY.

BY

REGINALD HARRISON, F.R.C.S.,

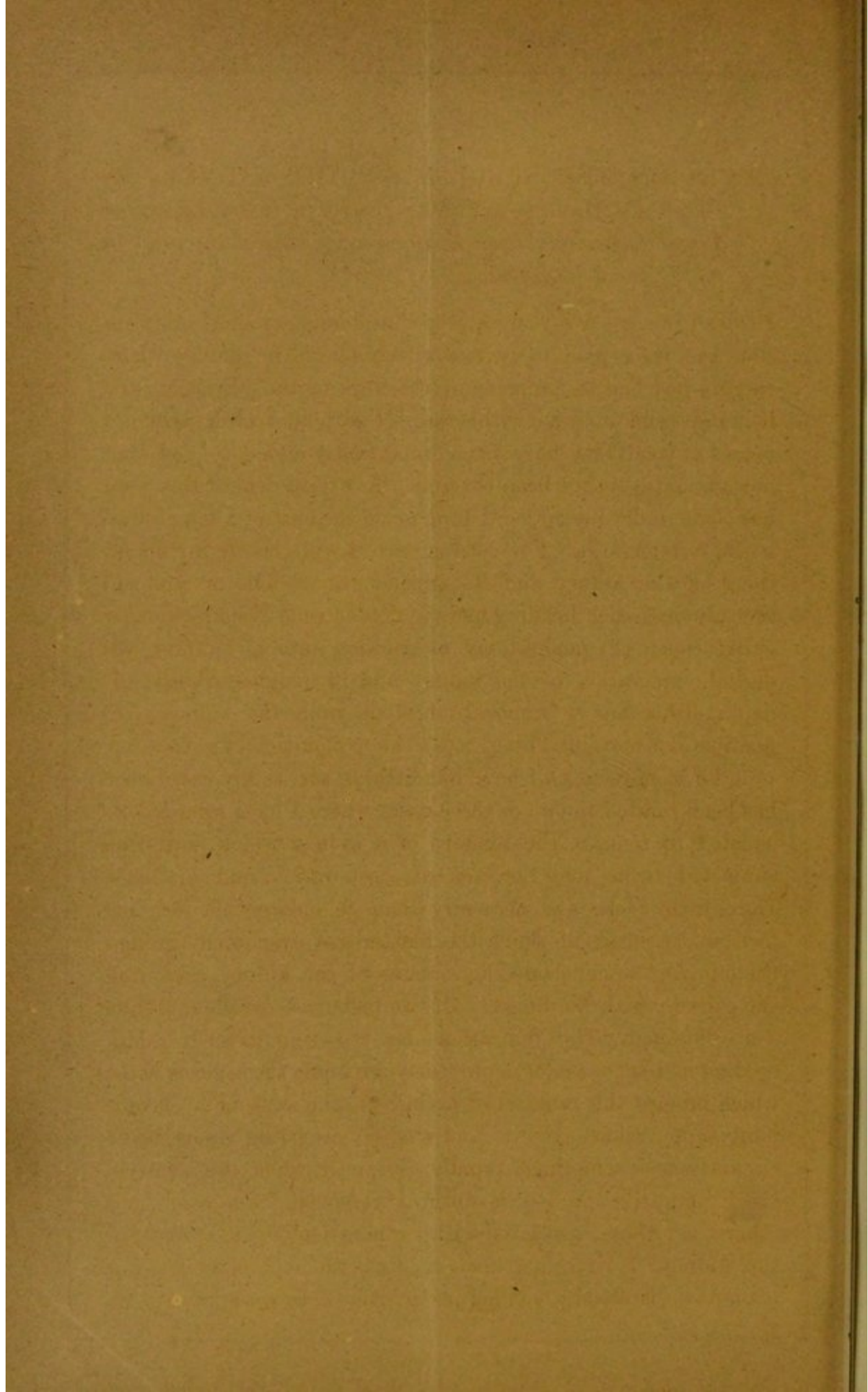
SURGEON TO THE LIVERPOOL ROYAL INFIRMARY, AND LECTURER ON
CLINICAL SURGERY IN THE VICTORIA UNIVERSITY.



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NOTES ON THE SURGERY OF THE KIDNEY. By
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Royal Infirmary, and Lecturer on Clinical Surgery in
the Victoria University.*

DURING the last few years a very considerable amount of attention has been paid to certain affections of the kidney where surgery has had to supplement the work of the physician, and it is impossible to review this subject without feeling that our means of treatment have been importantly added to, and that new ground has thus been covered. As a good deal of this work has come under my notice, I propose, in the form of a few clinical notes, to refer to it. For convenience, I will classify my operations on the kidney and its appendages as follows, and will then allude to each heading more in detail:—(1) Nephrectomy or extirpation; (2) nephrotomy or incision into a kidney; (3) digital exploration of the kidney and its neighbourhood; (4) nephro-lithotomy or removal of stone from the kidney; (5) fixation of a movable kidney; (6) the exploration of a ureter.

1. Of *nephrectomy* I have but little to say, as my experience has been limited to two or three cases where I have removed, or assisted to remove, the remains of a kidney which had been subjected to a long process of suppuration and drainage. Here little more was necessary than to enlarge the original incision, by means of which the matter was evacuated through the loin, and to enucleate the remains of the kidney, excluding the capsule, with the finger. In two instances excellent results were obtained. The indications for resorting to such a proceeding as a sequence of nephrotomy are much the same as those which prompt the removal of a limb in the case of a chronic joint suppuration. Hectic and wasting occurring under these circumstances sometimes rapidly disappear when the focus of the suppurative process is entirely removed. For conditions other than those associated with suppuration of the interior of the kidney, I have not had recourse to nephrectomy. For malignant disease of the kidney extirpation does not appear to me

to have been followed by any very promising results; the operation has often proved immediately fatal, and more remotely by the recurrence of the disease in other parts. Probably there is no better reason in favour of extirpating a cancerous kidney than the admission of our entire inability at present to deal with it in any other way. Nor are the conditions for undertaking an extirpation under these circumstances the same as apply to the breast or other parts, where the immediate risks of removal are smaller and the clinical features of the growths less unfavourable.

So far as mode of operating is concerned, my own predilection is for the lumbar incision. I am not aware there is any other reason for advocating the abdominal method other than it permits the operator to ascertain the presence of both kidneys, thus freeing him from the risk of operating on the wrong organ, or extirpating the only one the patient happens to possess. We are aware that the latter misfortune has occurred, and the physiological experiment accidentally made of seeing what becomes of a patient who is suddenly deprived of the power of excreting urine. As my cases of kidney extirpation have followed upon a previous opening and drainage, I have not felt that there was much risk of my being exposed to such an accident in proceeding to extirpation, and consequently I may have had less reason than others for not preferring the abdominal method. This, I think, is only fair to state in deference to those of larger experience, who, like Mr Knowsley Thornton, seem to favour the latter. I have adopted the plan of ligaturing the pedicle in a mass without drawing distinctions between artery, vein, and ureter. Secondary hæmorrhage after nephrectomy seems to be rare; in referring to two cases out of fifty-four related by Mr Barker,¹ Mr Bruce Clarke² remarks—"in both the vessels were ligatured separately, and to this cause it is not improbable the hæmorrhage may have been due."

2. *Nephrotomy*.—Incision into the kidney for the evacuation of matter has proved of much service. It is an expedient which should be resorted to in suppurative affections of the

¹ *Roy. Med. Chir. Trans.*, vols. lxiii. lxiv.

² *Surgéry of the Kidney*, p. 148.

kidney before recourse is had to extirpation. The most suitable forms of suppuration within the limits of the kidney for this kind of treatment are those where, unlike tubercular disease, the abscess is limited to one organ, and has little or no direct connection with the ureter. Coming under this heading we may also include those instances of pyonephrosis where a kidney becomes little else than a suppurating sac. Such a case came under my care some years ago, in conjunction with Dr Davidson, at the Royal Infirmary, where in a middle aged woman the right loin and side of the abdomen was occupied by a large fluctuating swelling, which was quite prominent in front to the right side of the median line of the body. This was aspirated from the anterior aspect, when it became evident that the swelling was of renal origin. I subsequently cut down on the kidney from the right loin, opened it, and let out a very large quantity of pus. The subsequent process of drainage lasted over several months, but the patient eventually made a good recovery. Though extirpation might here have given a speedier recovery if successful, I am satisfied that far less risk was incurred by the more tedious process that was adopted. In 1887 I saw with Dr Glynn, at the Royal Infirmary, a middle aged man, who presented a somewhat similar condition to that I have just described. Here opening and drainage were employed with equally satisfactory results, so far as the kidney was concerned, though I heard of his sudden death twelve months afterwards from heart disease. A much more limited degree of suppuration is illustrated in the following case, which I saw in consultation with Dr Glynn. It was that of a middle aged married lady, who was suffering from symptoms of circumscribed abscess in the right kidney. She was losing flesh, her rest was disturbed by constant pain in the right loin shooting down the corresponding groin, there were frequent high temperatures, and at times some pus in the urine. On examining the right lumbar region there was deep-seated fulness, with the sense of resistance to the hand, which was very characteristic. The conclusion arrived at was that the patient was suffering from an interstitial abscess of the kidney, which only imperfectly communicated

with the ureter. As she was rapidly losing ground I advised the exploration of the kidney; this was done under chloroform, and over an ounce of thick pus evacuated. A drainage tube was inserted and retained for about six months, when the wound finally closed, and the patient made a good recovery. I feared that we were going to have some trouble from the quantity of urine that was discharged for some weeks from the sinus. The wound, however, soundly closed, and remains so. In reviewing my experience of opening and draining the kidney, I have met with instances, as I have before said, where it became necessary to extirpate what remained of the suppurating organ, on the same principle that amputation of a limb sometimes follows an excision of a joint that will not heal. Unless the whole suppurating tract is removed the patient will inevitably sink, whatever may be the risk attendant upon the operation. In one instance I merely opened up the wound with my finger under chloroform, and scooped out a mass of suppurating kidney tissue, and then put in a big drainage tube. This answered well, and the patient recovered quickly and completely, and is now going about in excellent health with one kidney. A urinary fistula in the back sometimes remains long after the suppuration has ceased; this, as I have just mentioned, happened in two instances, and in one caused much annoyance to the patient by the profuseness of the discharge. Eventually, however, this ceased spontaneously, and the wound closed. More permanent inconvenience of this kind has been met with by other surgeons, and has necessitated the wearing of a special apparatus, whilst in others nephrectomy was proceeded with. In making the wound for kidney drainage, it is very desirable that the kidney substance should not be merely punctured but thoroughly opened up, so as to secure a free run from all parts of the abscess cavity, whatever its shape may be. Further, it is important that the incision in the soft parts should correspond with the most dependent portion of the kidney abscess cavity, and that the line of drainage should be as direct as it is possible to make it. In some instances it is well to secure the sides of the kidney incision to the corresponding side of the wound in the loin by

deep temporary sutures, so as to ensure correspondence throughout and thorough drainage.

In suppurative tuberculosis of the kidneys my experience in nephrotomy has not been favourable. In fact I would not recommend it unless there was something which determined with precision the presence of a single abscess which was not relieving itself adequately by the ureter. The mere fact of pain is in itself not sufficient for the purpose, as this symptom alone often proves misleading, owing no doubt to the remarkable sympathies and reflexes which exist both in health and in disease between the two kidneys and the ureters. In one instance that came under my notice not long ago, the pain and irritability about the neck of the bladder was so great that it was suggested the kidney should be opened and explored to relieve what was believed to be a tubercular abscess which could not drain. Post-mortem examination certainly showed an abscess in the kidney, but the intense pain and vesical irritability were doubtless caused by a deep tubercular ulcer about half way down the ureter. In a recent case I saw with my colleague, Mr Mitchell Banks, there could be no doubt that the patient, a young girl about 16, was suffering from tubercular disease, including probably the whole of the urinary apparatus, and this was proved after death to be so. There was everything about her to indicate that she was suffering from an abscess in the left kidney, which only imperfectly communicated with the ureter. Further than this, there was the fact that on introducing a male metal sound into the bladder, for the purpose of exploration, on two or three occasions it passed, without any difficulty, into the left ureter as far as the kidney. This kidney was opened, as the patient appeared to be suffering urgently from confined matter, and the pelvis was found to contain purulent urine, yet the abscess, a small circumscribed one, was in the opposite organ, though both were tubercular in varying stages. I have noticed the same on many previous occasions in the dead body long before operations of this kind were even in contemplation.

Where nephrotomy has been practised, we should not forget

the importance of endeavouring to determine the condition of the corresponding ureter, so far as patency is concerned. This may generally be done by passing some kind of instrument, such as a whip bougie, down it, or by the injection of water. A permanently blocked ureter means, of course, sooner or later, a destroyed kidney, and consequently our mode of procedure, both immediately and prospectively, so far as the damaged organ is concerned, may be modified or altered.

The following case of pyonephrosis, due to a small malignant papilloma of the bladder obstructing the ureter, bears upon the point I have just referred to:—

Henry P., *æt.* 47, was admitted into the Royal Infirmary under my care in November 1887. Three and a half years previously he had been crushed between a wall and a horse, injuring his left loin and causing blood to appear in his urine. He was seen by Dr Hewer of Formby, and the conclusion arrived at was that he had contused his left kidney. He recovered from this, but twelve months before his admission he again began to complain of pain in the loin, and blood frequently appeared in the urine. The pain in the loin became very severe, micturition was frequent, and there were some signs of cystitis. On admission into the infirmary the urine was found neutral, with traces of pus, half albuminous and sp. gr. 1018. At times it was found loaded with blood. The bladder was examined with the sound, but nothing abnormal could be felt by this means or by rectal examination. As the pain in the loin was the pressing symptom, and as this appeared to be directly connected with the previous injury, Mr Harrison explored the left kidney on November 29, 1887, by the usual incision. The organ was found undergoing a process of distension from within by fluid. It was opened and a considerable quantity of pus evacuated. A drainage tube was inserted. On December 1 it is reported:—Patient feels comfortable this morning, the pain has disappeared from left side and groin. There is a free serous discharge by the tube, the wound, with the exception of this small space, having united by first intention. Sleeps well. This improvement, however, did not continue;

blood again appeared in the urine, at times in considerable quantities, and there was a good deal of cystitis with frequent micturition. All the symptoms now pointed directly to the bladder, as the kidney pain had entirely ceased. Nothing, however, could be felt to explain the prominence of the bladder symptoms. The bladder was washed out on several occasions, but nothing was observed in connection with this to explain the symptoms just referred to. One specimen of urine tested for urea gave 9.62 gr. to 1 oz., or 480 gr. in 50 oz. On December 27 he had a sharp attack of diarrhœa, which so prostrated him that he died in the course of the night.

Post-mortem Examination.—Left Kidney.—Cortex very much diminished, and contains a caseated abscess. Pelvis much dilated and loaded with greenish-yellow pus. Ureter dilated and contains pus. Impervious at lower end. Right kidney considerably enlarged and pale in parts from cellular infiltration. Ureter patent, but dilated to three times normal size. Bladder contained 4 or 5 ounces of thick, creamy, purulent, and phosphatic fluid. Trigone and orifice of left ureter covered by a malignant papillomatous growth, eroded in parts. Mr Odell has supplied me with the notes of this case.

Though the operation relieved the pain which the distending kidney caused, there were no means of recognising the presence of the disease in the bladder which was the cause of this complication. The lumbar injury of three years previous seemed to me to be in some way connected with what followed. I regretted that when I had opened the kidney I did not ascertain whether the corresponding ureter was patent. If I had discovered this at the time of operation, it would have enabled me to disconnect the previous and subsequent hæmaturia with the kidney that I had opened, and would thus have brought me within an easier reach of recognising the true cause of the kidney complication.

3. *Digital Exploration of the Kidney and its Neighbourhood.*—This is a proceeding which I have now practised on many occasions, and from which I have been able to obtain information of a most valuable nature. I speak of it in my practice as a preliminary to all the operative procedures now

referred to, the necessity of which it may be said to determine. To the kidney it stands in precisely the same relation as perineal urethrotomy does to the bladder, and as a purely exploratory proceeding attended with little or no danger. Though the various affections of the kidney have, as a rule, well-defined symptoms, yet they sometimes exist and pursue their course without their development, or perhaps, I should say, their recognition. This is not always easy to explain, though most of us can call to mind instances where stone in the kidney, abscess, tumour, undue mobility, and the like have failed to make apparent those indications by means of which we are accustomed to recognise them. Is not this the case with the bladder and has not our knowledge of its diseases, and our means of treatment, become less empirical since an exploratory operation became a legitimate and frequently-adopted proceeding? And in the same light will digital exploration of the kidney become to be regarded. I could enumerate many instances where I have urged and practised digital exploration of the kidney merely for the purpose of searching for the cause of painful symptoms which have resisted all other methods of treatment, both medical and surgical. I have never had cause to regret this; on the contrary, without, I believe, a single exception, good has come out of it. It has not, however, been always clear how this benefit was obtained. Let me state two or three instances. In the summer of 1887 I saw at the Royal Infirmary, with Dr Davidson, a stout healthy married woman, about thirty-five years of age, who for over a year had been suffering from what appeared to be acute attacks of renal colic attended with considerable hæmaturia. Various kinds of treatment had been tried, and were tried, but without avail, and she was anxious to submit to any operation that offered a prospect of relief. I thought she had stone in the kidney, and advised exploration. This was done by me, and, in consequence of her stoutness, I had to make a much longer incision than usual, as until I got my hand fairly within the parietal wound it was impossible even to touch the kidney with the tip of my finger. I was enabled to feel it thoroughly with the hand, and I also explored

it with a needle in several places, but no stone could be found. I thought the organ was more movable than natural, and that this might possibly be the explanation. However, she made a rapid recovery, and has remained well since. I saw her a few weeks ago. I never knew a case where the symptoms, in their kind and undoubted severity, more closely resembled renal stone, yet I am satisfied there was none. I have now seen three cases of renal hæmaturia, where the bleeding ceased after digital exploration, and where the kidney had been well poked about with the finger in the attempt to discover the presence of a stone which really had no existence.

The last instance was in the case of a man whom I intended to explore in consequence of severe renal hæmaturia. Whilst he was under observation in the hospital, in spite of various styptics, he passed large quantities of blood, and it seemed to be increasing. As I was just leaving for America, I transferred the patient to my colleague, Mr Rushton Parker, who, after watching him for some time, operated and explored the kidney, but without finding anything to explain the bleeding. However, so far the bleeding has ceased, and the patient has been able to resume his work. Here, there can be no doubt, the hæmorrhage was at once checked, though whether permanently so it is premature to say, as barely three months have elapsed since the operation.

A middle aged man was under my care last summer for right nephritic colic, which seemed from some pieces of stone he had passed to be due to them. He continued to suffer much in this way, in spite of various remedies, and I advised digital exploration of the kidney. This was done, and, in addition, I inserted a capillary trocar at one or two points, but nothing was found. He speedily recovered, and had no recurrence of the colic symptoms.

It is difficult to offer a satisfactory explanation for results such as these. Similarly, in some cases of kidney exploration performed by Professor Annandale, he also found benefit follow. In the absence of any special reason, he thought this might be due to the division of a nerve, which was in some way responsible for these perversions of sensation and function.

In making an exploration, I usually do it by means of an incision across the lumbar region parallel with the last rib, about four inches in length, commencing at the outer edge of the erector spinæ muscle. In stout people I supplement this by a short vertical incision downwards, parallel with the edge of the erector. This, as a rule, gives ample space for manipulation. If the kidney contains anything abnormal, there is a sense of tension and rigidity conveyed to the exploring finger which is very characteristic. Assuming nothing is found, a drainage tube is inserted, and the wound closed with sutures and an anti-septic dressing. I have not yet explored both kidneys of a patient from the loins, of course allowing an interval to elapse between each proceeding, but, should the necessity arise, I see no objection to it. In one instance where exploration was decided upon, I found the symptoms due to a small collection of matter in the fat and cellular tissue surrounding the kidney. I have very little doubt, from the history of the case, that it originally proceeded from a circumscribed kidney abscess, which had thus spontaneously discharged itself. A drainage tube was inserted into the bottom of the lumbar incision, and the patient was well within a fortnight. There has been no recurrence of the previous symptoms.

4. *Nephro-lithotomy*.—By this name Mr Henry Morris¹ first described “the operation of cutting a stone out of a kidney which, so far as can be ascertained by clinical examination, is not dilated or otherwise altered in form.” This is a proceeding which I have resorted to on three occasions. In two instances the calculi were small: one was contained in the pelvis of the kidney, and had induced an early condition of hydronephrosis, and the other a small urate about as big as a bean was found encased in phosphates in a suppurating calyx. Both these patients did well, and the removal of the stones undoubtedly prevented the ultimate disorganisation and destruction of the organs containing them. Without entering into the pathology of renal calculus, it was quite clear in one instance that the stone simply plugged the ureter as it left the kidney. Urine secretion con-

¹ *Trans. Clin. Soc.*, 1881.

tinuing, the whole kidney structure was commencing to yield to the pressure of the fluid, which had no means of escape. I have no doubt that in the course of a few weeks the kidney would have been thus converted into a mere bag containing urine, with perhaps some remnants of its original structure. The removal of the stone, which no doubt acted as a cork, was followed by the complete restoration of the function and structure of the crippled organ. In the other instance, though the stone was small and contained within a calyx, it was the focus of an active inflammation, which no doubt would have led to the disorganisation of the kidney. In both of these cases there had been symptoms of renal colic, attended with considerable hæmaturia, and I felt no hesitation in advising that exploration of the kidney should be proceeded with.

In the following case it might have been better to have removed the kidney with its contents at the first operation:—

William W., æt. 45, was admitted into the Royal Infirmary on May 12, 1887, under the care of Dr Glynn. His chief symptoms were pain in the right lumbar region, with some tenderness on pressure, but with no perceptible fulness. His illness commenced with right renal colic, seven weeks before admission. The urine was acid, and contained $\frac{1}{6}$ pus and albumen, with a few granular casts. There appeared to be no very clear history of hæmaturia, though blood was occasionally detected in the urine by the microscope whilst he was in the infirmary. Mr Harrison saw the patient with Dr Glynn, and advised exploration of the kidney from the loin. This was done on May 21. On exposing the kidney and introducing an aspirator needle, a quantity of pus escaped. The cavity was then freely opened by a vertical incision along the outer edge of the organ, and the interior exposed. In doing this, about one dozen small rounded urate calculi escaped or were scooped out with the finger. As nothing further could be felt with the finger, a large drainage tube was passed into the kidney cavity, and the wound approximated with external sutures.

On May 25, it is reported:—Had very little sleep last night,

due to severe pain in region of operation. Pulse, 96; temperature, $100^{\circ}\cdot4$ at night, $99^{\circ}\cdot6$ in the morning; urine, 28 oz. in the 24 hours; sp. gr. 1022; pus, $\frac{1}{2}$; albumen, $\frac{1}{8}$. Two small calculi were removed yesterday. On June 13 the patient was able to get up for a few hours each day, and felt the better for it. The wound continued to discharge freely through the drainage tube, the pus at times being offensive. At the end of July the patient was able to go to the Convalescent Institution, but returned to the infirmary early in October.

On October 8 it is reported that the discharge from the wound is very offensive in spite of frequent antiseptic dressings. The patient looks very anæmic, though, except for some annoyance from hæmorrhoids, he expresses himself as feeling well.

On October 18 he was put under ether, and Mr Harrison opened up the sinus and the opening into the kidney, and with some difficulty, by reason of their shape, removed four calculi,



two of them, when put together, forming an almost complete cast of the dilated pelvis of the kidney. They consist of urates, coated mainly with phosphates, and when dried, weighed 286 grains. They present the appearance shown in the drawing.

After the operation the patient became very exhausted, and, in spite of all restoratives, died seven hours afterwards. There was considerable hæmorrhage from the sides of the spaces in which the calculi was lodged, which, though stopped with plugs of lint dipped in turpentine, induced, I believe, fatal syncope.

Unfortunately, the examination after death had to be con-

ined to the diseased kidney. It was found adherent by its capsule to the liver above and the colon in front, and was removed through the loin with considerable difficulty. The organ consisted of a fibrous and gelatinous mass, separated into lobules by septa. The cortical substance was entirely gone, the fibrous pelvis, with its prolongations, alone remaining. The opposite kidney was not examined, but, from the high specific gravity which the urine maintained throughout the patient's illness, it may be assumed that it was not appreciably involved in the disease. The notes of this case were prepared by Messrs Lightbody and Costine.

In reviewing these particulars, I cannot help feeling that at the first operation the main stem of the calculus escaped detection with the finger, and was consequently not removed. Having explored some few kidneys, it seems difficult to understand how this happened, as my opening was free, and I was conscious that my finger had passed from the cortical into the tubular portion of the organ. Had I, however, in this instance, used an exploring probe as supplementary to the finger, I should have felt clearer in reference to this point. That the main mass (as figured) had considerably increased in size during the interval of over twenty-one weeks that elapsed between the two operations I can have no doubt. If I understood Dr W. Carter correctly, in some conversation I had with him incidentally, shortly after I removed the figured specimen, he seemed to think, from some observation of his own, that it was quite possible, if not probable, for the mass to form in such an interval of time.

From an operator's point of view, one would be rather glad to avail oneself of such a suggestion. Looking at the mass itself, the position it occupied in the kidney, the extent, persistence, and often foetid character of the discharge, as well as the presence of certain pains about the part, of which the patient at intervals complained, I cannot come to any other conclusion but that an important nucleus for stone concretion remained after the first operation. In another instance, the persistence of such conditions as I have just enumerated would suggest the propriety of a further and an earlier exploration. Whether the

kidney was at the time of the first operation in such a condition of structural disorganisation as would have been best treated by total extirpation is, I think, a question which the event would seem to answer in the affirmative.

The case is one of interest from several points of view, and shows how carefully and thoroughly these explorations should be conducted. Whether the adhesions between the capsule of the kidney and the liver and colon existed at the time of the first operation it is impossible to say. They would, however, have proved a serious obstacle to success had extirpation from the loin been attempted on the second occasion of digital exploration.

Of the two remaining operations (5) *for fixing a movable kidney* and (6) *for the exploration of a ureter from the loin* I have little to say, as I have no certain data for illustrating them. That in some cases symptoms, such as pain and hæmaturia, might have been caused by an undue mobility of the organ, or by the impaction of a calculus at the commencement of the ureter, there seems to be some ground for believing, by reason of the certainty with which such symptoms have been removed or relieved by the direct manipulation of the kidney and its duct by digital exploration applied to these parts. In the one instance such a process might have contributed to the fixation of the part by adhesion, whilst in the other it is not unreasonable to believe that it would aid in the expulsion along the ureter of what might have proved to be a source of irritation. In cases of calculi impacted in the lower end of the ureter, and projecting into the bladder, they would of course be accessible from this viscus. Mr Godlee¹ reports an instance of this kind in an extremely interesting paper relating to the surgical treatment of renal calculi, where a stone was forced into the urethra by two fingers of the left hand introduced into the vagina. The calculus had been previously detected by digital exploration of the bladder projecting from the lower end of the right ureter.

¹ *The Practitioner*, vol. xxxix.



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