NEPHRECTOMY BY LUMBAR SECTION.

BY

ARTHUR E. BARKER, F.R.C.S.,

ASSISTANT SURGEON TO, AND ASSISTANT PROFESSOR OF CLINICAL SURGERY
AT, UNIVERSITY COLLEGE HOSPITAL.

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IN a paper which I had the honour to present to this Society last year, a case of "Nephrectomy by Abdominal Section" was described, which I had recently performed for a malignant growth of the kidney. In that communication some conclusions were hazarded which I ventured to think might be fairly drawn from experience of the operation in question, together with a careful study of all the other cases hitherto recorded (28 in number) collected from different home and foreign sources and appended. In expressing these conclusions and opinions I was in hope that service might be rendered to others who should thereafter feel called upon to perform this operation, the consideration of which, being a new procedure in this country, had required much time and labour. This operation is still on its trial, and it is quite as desirable that its dangers and weak points should be thoroughly well known as that its benefits and strong points should be brought out. Feeling this, I now place two other cases before

the Society, which, though they have unfortunately proved fatal, illustrate some of the difficulties to be overcome. They also show to some extent how this is likely to be accomplished.

But before describing the cases themselves, I may perhaps be allowed to allude to what has been done in this branch of surgery since the paper referred to was published in the 'Transactions' of this Society. I now lay before you a second table containing twenty-six new cases collected from a number of sources. These, added to the twenty-eight recorded in my first paper, make up a total of fifty-four cases of attempted or completed nephrectomies, designed or undesigned. This number it will be seen includes one or two operations which can hardly be said to have been completed, but which must be included in estimating the gravity of the procedure, since the aim of the surgeon was the removal of the kidney. But though the number of these operations now presented to us is considerable, we must not draw our conclusions from a mere numerical examination of the results. When a much larger number of cases has been fully and accurately recorded, a rigid statistical analysis can be made.

The records of the last series have been generally much more ample than those of the first, and therefore much more valuable.

Examining the list before you, the following points of at least general interest may be noted :

Out of the total of 28 cases tabulated in last year's communication it will be seen that 14 recovered and 14 died. But, excluding 6 cases in which the operator's original design was not nephrectomy, that 13 recovered and 9 died.

Out of the present 26 cases since collected, 12 recovered and 14 died, or, again, excluding 5 cases where nephrectomy was not originally intended, of the 21 remaining, 11 recovered and 10 died.

The causes of death in these 10 cases range themselves as follows :—Shock and collapse 3, uræmia 2 (in 1 of

these complete destruction of the remaining kidney was found to be the cause), hæmorrhage after operation 1, pyæmia 1, wound of pleura with immediate pulmonary collapse 1, vomiting and exhaustion 1, thrombosis of the pulmonary artery 1.

Of the 4 deaths, where the operator's original intention was not a nephrectomy, 3 were from peritonitis, and 1 from hæmorrhage at the operation.

Turning to the successful cases, it need only be noted that recovery is specially described as being complete in 7, slow in 3, no note on this point in 1, and 1 case is still in hospital.¹ In none of these successful cases were any marked uræmic symptoms observed. And, indeed, in only two of the unsuccessful cases do we find such. But in these two patients the remaining kidney was found to be completely destroyed by disease in 1, and in the other the liver and remaining kidney were in a state of advanced fatty degeneration. Again, among the recoveries marked shock is only noted in 1 case. Finally, of the 11 designed nephrectomies which were successful, 7 were lumbar and 4 ventral sections. To the latter might be added that 1 successful case where removal of the kidney was not the primary object of the operation (No. 35).

Of the 14 fatal cases, 7 were lumbar 7 ventral sections, or, excluding the same class as above, of the 10 remaining, 7 were lumbar and 3 ventral.

Combining now the tables of last year and the present, the following facts come out :—Of 54 cases of removal of the kidney, 26 have recovered and 28 died. Deducting, however, 11, where the operator's original purpose was not nephrectomy, there remain 43, of which 24 recovered and 19 died.

Of these 24 recoveries, 16 were lumbar and 8 ventral operations. To the latter might be added two other successful cases (Nos. 12 and 35), excluded because originally undesigned.

Out of the 19 deaths, 11 were lumbar and 8 ventral

¹ Now quite recovered (October, 1881).

operations. To the latter might be added 9 excluded for the above reason.

	<i>Deaths.</i>				<i>Recoveries.</i>				<i>Total.</i>
	1st Table.	2nd Table.			1st Table.	2nd Table.			
Lumbar	4	+	7	= 11	...	9	+	7	= 16 ... 27
Ventral	10	+	7	= 17	...	5	+	5	= 10 ... 27
	<u>14</u>	+	<u>14</u>	= 28	...	<u>14</u>	+	<u>12</u>	= 26 ... 54

Excluding all cases not commenced with the aim of nephrectomy :

	<i>Deaths.</i>				<i>Recoveries.</i>				<i>Total.</i>
	1st Table.	2nd Table.			1st Table.	2nd Table.			
Lumbar	4	+	7	= 11	...	9	+	7	= 16 ... 27
Ventral	5	+	3	= 8	...	4	+	4	= 8 ... 16
	<u>9</u>	+	<u>10</u>	= 19	...	<u>13</u>	+	<u>11</u>	= 24 ... 43

The kidney, then, has been removed twenty-seven times by lumbar section with 11 deaths, and twenty-seven times by ventral section with 17 deaths.

These numbers, however, do not convey a correct idea of the relative danger of the two procedures, for it would be manifestly wrong to include those cases in our calculation where nephrectomy was not the original object of the operation, which all range themselves with the ventral sections. If these, 11 in number, be excluded, our total of ventral operations is 16, with 8 recoveries and 8 deaths.

But, as far as numbers go, these figures show about 59½ per cent. of recoveries with lumbar nephrectomy, and 50 per cent. with the ventral operation.

Judging now from a larger number of records than was available last year, from three cases of my own, and from two others which I have witnessed, my own conclusion is that nephrectomy by abdominal section will eventually be found as useful and as successful as that from the loin. What we want to know now is which cases are suitable for the one and which for the other procedure. But this cannot be determined until we possess much more knowledge of, and power of distinguishing between, the different

morbid conditions, not only within but also surrounding the kidney. There are, for instance, certain cases in which the organ is embedded in a dense mass of inflammatory perinephritic tissue, too tough to allow of our isolating the structures of the pedicle or of tying them effectually *en masse*, and too vascular and widely connected to admit of its being removed in part or as a whole with the kidney. In such cases this operation ought not to be attempted. But, as yet, we have very slender objective or subjective evidence on which to base a diagnosis as to whether such a stage has been reached as yet or not in the perinephritic structures.

The two case I have recently operated on bear on these points.

CASE 2 (No. 45 in Table).—Mrs. H—, æt 32, admitted into University College Hospital under Dr. Wilson Fox, on June 16th, 1880. Has been married twelve years, but never pregnant. Has lived in healthy situations; temperate; family history good, both parents alive. Patient has generally enjoyed good health, but since she was five years old has from time to time suffered from left renal colic; is not able for more than slight exertion. The renal pain has been decidedly worse since marriage, and she has felt increasing languor and weariness.

On May 18th, 1880, she first noticed a tumour in the left renal region, about the size of an orange, her pain and weakness increasing. Since then the swelling has enlarged with great rapidity, and has nearly doubled its volume within the last fortnight, which has been spent in hospital.

Present state.—Complains of pain in left renal region, and much lassitude. Tumour felt in left lumbar, hypochondriac, epigastric, and even part of inguinal and umbilical regions. It is extra-pelvic, freely movable by palpation and on respiration; it measures transversely fourteen, and obliquely downwards and forwards fourteen and a half inches. Outline seen as well as felt through abdominal walls. Tumour smooth and fluctuating, outline

rounded. Percussion note dull from anterior border to spine, but below edge of ribs is tympanitic.

Urine is passed with much frequency and smarting when patient is out of bed, less so in bed. Fluid smoky, containing blood discs and pus cells. Menstrual history fairly good until four months ago, since then flow scanty, every two or three weeks. Vaginal examination reveals nothing abnormal. Pulse small, 108; respiratory system normal.

On July 1st, at the wish of Dr. Wilson Fox, I aspirated the tumour from behind, and drew off twenty ounces of dirty-yellow, fetid pus, stained towards the end with blood.

Diagnosis.—Pyonephrosis, with sacculi not freely communicating with one another. Cause probably a calculus, though none was felt with needle on aspiration. The latter operation produced some weakness, nothing more. Next day the tumour had plainly refilled considerably.

Dr. Wilson Fox, having kindly asked me to take charge of the patient, her condition was explained to her, and operation proposed.

The very rapid development of the tumour to its present size led to some suspicion of a malignant growth in addition to pyonephrosis. The presence, too, of a mass undiminished in size, after aspiration had reduced the posterior swelling, gave some support to this view, which was suggested by Dr. Fox. This only strengthened the necessity for operation. But should this unspirated mass in front simply consist of one or more abscesses distinct from that already emptied, the difficulty of draining the whole of the pus away from several separate chambers by aspiration led me to think that any operation short of removal of the whole organ would be as unsatisfactory as experience shows such operations usually to be. To break down, on the other hand, all the loculi into one ragged cavity in the kidney through an incision in the loin, I considered to be fraught with more immediate danger from hæmorrhage, and ultimate danger from pro-

longed suppuration, than the complete removal of the whole organ would involve. It was determined, therefore, to expose the kidney in the loin, and if found converted into a suppurating cyst to open it and search for a calculus. If the latter should not be found, or, if found, should be so firmly engaged in the organ that its removal would necessitate much laceration, that I should endeavour to remove the kidney and its contents *en masse*.

Operation on July 5th. Listerian antiseptics. An incision was made in the loin midway between the crest of the ilium and the last rib, commencing nine centimètres from the spine and running downwards and forwards for about four inches. The kidney was rapidly reached, only a few small vessels requiring care. I then endeavoured to enucleate the organ, but was hindered by its size. It was, therefore, aspirated, and about twelve ounces of fetid pus drawn off. Still the difficulty remained, and I was obliged to thrust my finger through a thin spot of the renal cortex and open a distinctly separate abscess, from which more pus escaped. After this the exact limits of the organ were found, and it was shelled out of its capsule without much trouble until the pedicle was reached. This was tied and the organ cut away. But during the endeavour to isolate the diseased mass in the first instance a very considerable amount of parenchymatous oozing had taken place. No individual vessel could be seen to bleed, but the tough, vascular, congested tissues yielded a free flow. This appears to me to be the most instructive point, and to teach the most important lesson of the whole case. The fact was this, as proved post mortem. The kidney was enveloped in a very thick covering, about three quarters to one inch in depth, consisting of the proper capsule of the organ with its surrounding fat and areolar tissue, the whole being converted into a tough, extremely vascular, and widely attached envelope. When I first reached the kidney I endeavoured to remove this envelope with the latter contained,

instead of seeking to enucleate the organ alone. It was in working with my fingers in this very vascular and tough perirenal tissue that much blood was lost. Eventually I removed the kidney from within the perirenal tissues with ease, and with a trifling loss of blood. The organ on removal was found to contain a small calculus, the size of a horse-bean, impacted in the commencement of the ureter, and to be consequently distended with pus, forming, however, several almost distinct abscesses.

The pedicle was tied in two portions with silk. After its division some small vessels sprouted, which were ligatured with little trouble. The mouth of the renal artery was also secured again for safety. Drain tubes and a gauze dressing completed the operation, which had lasted one hour and twenty minutes.

The patient was then carried back to bed in a very weak state, and in spite of all stimulation died three hours later of the shock of the operation.

Necropsy (July 6th).—Operation wound unchanged and without clots. In the situation of the kidney was found the very thick envelope mentioned above, consisting of the enormously thickened investing structures of the organ and forming even now a thick resistant mass in the lumbar region. On its peritoneal surface were seen numerous small whitish-grey bodies not unlike miliary tubercles. These were also scattered over the whole serous covering of the pelvis, and especially about the uterus. The small intestines were attached to the uterus by rather recent soft lymph. The small miliary bodies were also noticed abundantly in the mesenteric folds. Their nature was not more precisely made out. The peritoneum was not opened.

All the other organs were normal except for some adhesions at apices of both lungs and for some of the small bodies resembling tubercles already mentioned upon the surface of the liver. The right kidney was healthy.

The left renal artery and vein were included in the same ligature surrounding the whole pedicle just at their

division and contained thrombi in two cases. Their mouths were also secured.

The inner surface of the inflamed capsule showed the sacculated outline of the kidney very well.

CASE 3 (No. 46 in Table).—Mrs. S—, æt. 38, admitted into University College Hospital January 18th, 1880. Married many years; has never been pregnant: family history generally good, but father cut for stone in the bladder thirteen years ago. Has had a pain in right renal region for six or eight months, aggravated by exertion, especially since last Christmas. Swelling, noticed at same spot for last two and half months, has been increasing during last month. The pain is continuous not paroxysmal.

Menstrual history satisfactory. Urine sufficient, but offensive for some months, and contains much pus. Hæmaturia never noticed.

Present state (January 21st, 1880).—Thin and unhealthy looking, sallow and anæmic; lies on back or left side. Pulse 108, regular; circulatory and respiratory systems normal; bowels constipated.

On February 3rd complained of pain in tumour, which felt larger than before, also nausea and vomiting.

9th.—Slight rigor, less pain. Examination showed the abdomen flat, a tumour extending from border of right ribs to three quarters of an inch below level of umbilicus, which it nearly reached in midline. The surface of this tumour is hard and bilobed, smooth and tender. It moves downwards on deep inspiration, also inwards to midline. Its lower end is well covered by intestine.

The urine during this first stay in hospital was itself almost normal, quantity usually forty to fifty ounces in twenty-four hours, reaction acid, sp. gr. 1020, but contained usually a large amount of pus. The pus was more abundant after attacks of pain in tumour.

On February 21st, 1880, I passed an aspirator into the tumour from behind, 7 centimètres from spinous processes and midway between ribs and *crista ilii*. At about two inches deep was a calculus struck in the substance of the

kidney, which was at the same time pressed backwards by the hand on the abdomen. About one ounce of inodorous pus barely streaked with blood was aspirated. The calculus appeared large.

On February 23rd, 1880, the patient left the hospital, not wishing to have anything done for her renal disease.

She returned to University College Hospital, requesting operation, on September 2nd, 1880, when her condition is noted as follows:—Thin, flushed, eyes bright; profuse night sweats; pain in right hypochondrium and back, worse after movement, and occasionally shooting into right groin and labium; no rigor for some time; no blood, but abundance of pus in the urine.

The same tumour present as before, but it does not move with respiration; the percussion note is dull over its most prominent point, but elsewhere subtympantic, except over its lower end, where a full tympanic note is obtained. Fluctuation doubtful, and it is very tender.

For the next twenty days I watched the patient, and had the urine carefully observed, as well as the temperature, which rose at night and fell in a regular way, as is often seen in such cases, finally deciding to operate, though far less hopeful as to the result than six months previously when patient was first seen.

Operation (October 5th, 1880).—An incision was made downwards and forwards from the middle of the twelfth rib for five inches. The thickened perinephritic tissues were reached with ease, but some care was necessary to distinguish the various layers into which they could be torn from the actual surface of the kidney itself. On reaching the latter an aspirator needle was thrust through the cortex, and the stone found in the same position as noted six months before. Some clear fluid and some pus were then evacuated. I then cut through the cortex with Paquelin's cautery knife until the calculus was reached, which could then be felt with the finger embedded firmly in the pelvis of the organ and surrounded by offensive pus in small quantity. I seized it with a forceps and

withdrew a piece about as large as the last joint of the thumb, the larger part being left behind, very firmly embedded in the organ. Finding it very difficult to deal with this it was determined to enucleate the whole organ, which was done with little difficulty and but trifling oozing of blood. At the lower end the kidney was very firmly adherent to the capsular structures. In tearing this loose I was conscious of something extra-renal giving way, and believed it to be the colon, as was seen, post mortem, to be the case. But even after the organ was quite freed the pedicle could not be reached sufficiently to command the vessels. An attempt was then made to draw the kidney forward by means of a loop of twisted wire passed round the hilus, but also failed, the whole mass being very firmly attached to the spine by the tough fibrous tissue in which the structures of the pedicle were enveloped. I therefore tied a thick silk ligature round this mass as firmly as possible, in the hope that the organ might slough off, as has taken place in other cases. While tying this it could be felt to cut into the tissue of the organ. It was now found that the stone could be extracted. Silver stitches, a drain tube, and antiseptic dressing completed the operation, which had lasted one hour and ten minutes. Very little blood was lost during or after operation.

The pulse was good until the time at which the pedicle began to be manipulated freely. It then became very weak, especially when the ligature was tied. After the patient had been in bed for a time the pulse became better.

Next morning at 12.30 a.m. the patient was very weak in spite of various stimulants. She was quiet, however, and did not appear to suffer. She had vomited everything since the operation. She died at 3.30, or twelve hours after the operation.

Autopsy (twenty-six hours after death).—The operation wound was but little altered, and showed no blood effusion or clots. In the abdomen the viscera occupied their usual position, except the colon, which ran across at the level of

the umbilicus. The renal flexure of the colon was attached by old, tough, and blackish adhesions to the abdominal wall and lower end of the capsule of the kidney. It was here that in clearing the lower end of the organ during the operation I had torn a hole in the attached and almost sloughy colon large enough to take the finger-tip. A small rent in the adjacent peritoneum was also found. The rest of the abdominal cavity looked normal except for old and extensive peritonitic adhesions. A great mass of tough inflammatory tissue had formed round the kidney, especially towards the spine. Here the vena cava, renal vein, and artery were found embedded in it. This thick capsule reached from the spine to the crest of the ilium. It consisted of firm, whitish, fibrous material, about one inch thick, and was plainly the result of long-standing disease. This capsule was found perfect everywhere except where the colon was attached to it, and here the opening mentioned was seen from within. The kidney had separated very cleanly from it except at the same spot, and lay, still held by its hilus, in the cavity, somewhat bruised but smooth, and in this state of about normal size. It was impossible to distinguish the renal vessels in the tough fibrous mass mentioned without careful dissection.

On the whole, the conclusion seemed inevitable, from examination of the parts about the hilus, that in this case it would have been next to impossible to have isolated the pedicle sufficiently to have ligatured the renal vessels either *en masse* or separately. This was due, *not* to the depth of the wound, but to the very dense nature of the material produced by the chronic inflammation around the root of the organ.

The other kidney was normal in size and structure.

The other abdominal organs were also healthy, except the ovaries, which contained several cysts.

The conclusions which appear deducible from these two cases are as follows :

First, that the last of them was not suitable for

nephrectomy at the time operated on, although probably a fit case when first seen more than six months before. The great mass of tough perinephritic tissue surrounding it, especially at the pedicle, as well as the adhesion of, and impending sloughing in, the colon contra-indicated the operation.

Next, that although it was undertaken late, it demonstrated the comparative ease with which the kidney can be enucleated out of its capsule even when the latter has been greatly thickened and become matted with the perinephritic tissues, but that though this is the case, it may still be impossible to deal satisfactorily with the vessels in the pedicle in some instances.

The first lumbar case, on the other hand, demonstrates the difficulty and danger of removing the kidney with its surrounding and much thickened capsule. This was found impossible in the first part of the operation, and resulted in much loss of blood, while a little later the organ was easily enucleated out of its capsule, and, unlike the other case, its vessels reached without too much difficulty and secured. Had I commenced in this instance by searching for the actual surface of the kidney and by "shelling it out" alone, much time and loss of blood would have been avoided, and I think the result would have been quite different. Too much stress cannot be laid upon this point in view of future operations. In every case where the surface of the organ has not been reached in the first instance and followed carefully, very great difficulty and delay in isolating it has resulted. In my own second case this was most notable, as also in that of Lefort.

On the other hand, where the surface of the organ has been carefully followed with the finger, enucleation has not been attended with very much difficulty. This was plain from my own third case, as well as from two others which I have seen operated on, namely, those of Mr. Couper and Mr. Baker.

The presence of a calculus in the kidney from an early

age which produced no injurious consequences until over twenty years later is also a point not to be lost sight of. Also the suddenness with which symptoms of pyonephrosis set in.

A few words regarding the incisions used in these cases. In each the lumbar wound has been oblique. As I had a large body to remove in both instances, I did not regard Simon's vertical cut as large enough, and consequently incised from the twelfth rib downwards and forwards. This incision gave free access to the organ in both cases, and I think was more desirable than the directly transverse cut such as one makes in colotomy. The latter brings the operator rather closely down upon the peritoneum, though this need not necessarily wound in consequence. It certainly has its advantages over the vertical incision, but I question if it is likely to be eventually as much used as the oblique, which can be prolonged to almost any extent downwards without trespassing too much on important structures.

A few words as to the resection of the last rib in order to obtain space for the hand in tying the pedicle. This has been twice done by Czerny successfully, the patient recovering in both cases (Nos. 25 and 42). It should be noted, however, that Dummreicher (No. 32), in carrying his incision upwards to what he supposed the twelfth rib, opened the pleura and caused fatal collapse of the lungs, the twelfth rib being only rudimentary in this instance, as is not uncommonly the case, and the eleventh being the last rib felt. In one of Czerny's cases the eleventh, in the other the twelfth, was resected, however, showing that the pleura is not necessarily opened in dealing with the eleventh. In my own last case I tried post mortem, before making a general examination, whether resection of the last rib would have facilitated tying of the pedicle, and, though I found the resection of the bone easy and not dangerous, satisfied myself that in this case it would have in no way diminished the difficulty.

Many other points of great interest come out in the

study of the cases already recorded, but being foreign to the scope of this paper must be reserved for another occasion. My object here has been to examine the subject in so far as it has any bearing upon the two cases now recorded in which nephrectomy was performed for calculous pyelitis.

As to the question of the effect of simple removal of one kidney on the system in otherwise healthy individuals, I have little to add to the remarks ventured on in last year's communication, namely, that it is not nearly so formidable an operation as is commonly imagined. Of this I think there is abundant extra evidence in the new list of cases I have now the honour to present in addition to those of the first list which appeared to me to prove this view. Any one who will carefully consider Nos. 35, 36, 38, 41, 42, will, I think, be convinced of the correctness of this assertion. The operation is no light one, of course, but I cannot but feel that the real difficulties of the whole procedure to be rather in the direction of early diagnosis and the avoidance of unsuitable cases than in its own intrinsic danger, and that in the future these difficulties will be overcome by patient study.

No. 1	Operator and original record.	Sex, age, state.	Diagnosis or aim of operation.	Evil dates back.	Date of operation	Seat of incision.	Form of dressing.	Treatment of pedicle.	Symptoms after operation.
29	Hueter (Greifswald), 'Deutsch. f. Chir.,' Bd. ix, p. 572	F., 4 years, healthy	Splenic or ovarian sarcoma	1 year	1876 4th July	Linea alba	Strictly anti-septic	—	—
30	Billroth (Vienna), 'Archiv f. Klin. Chir.,' Bd. xxi, S. 694	F., 46 years, healthy	Ovarian cyst	5 years	1876 18th July	Linea alba 9 cm. downwards from umbilicus	Listerian with drains, retroperitoneal wound well cleansed	Double hempen ligature	Acute peritonitis on 2nd day, with fever, pain, vomiting, singultus, and meteorismus
31	Heath (London), Private Note-book	F., 24 years, healthy, 4 pregnancies	Multi-locular cyst of right ovary	1 year of pain and swelling	1877 28th Jan.	Linea alba: enlarged later	Cotton wool and strapping	Ureter tied alone, then vessels separately with silk, then <i>en masse</i>	Great pain, most on vomiting. Symptoms of peritonitis set in on 3rd day, and fluctuated
32	v. Dummer (Vienna), 'Archiv f. Klin. Chir.,' Bd. xxv, H. 1, 1880	M., 33 years, weak, anæmic, suffering	Calculous pyelitis, with perinephritic abscess on left side	From childhood, worse last 10 years	1877 6th Aug.	Lumbar, Simon's incision, 12 cm. long	Plugging to check oozing, a large sponge over all	Ligature, but ineffectual	Shock, then improvement, finally collapse; urine bloody
33	Müller (Oldenburg), 'Berlin. Klin. Wochensch.,' No. 24, 1880	M., 21 years	Calculous pyelitis on left side	3 to 4 years	1878 18th Feb.	Lumbar, Simon's incision	Carbolised jute and carbolic injections	Double catgut and <i>en masse</i>	None special; slight attacks of fever whenever drainage was imperfect

¹ This table is in numerical continuation of that published

Result, immediate and eventual.	Hæmorrhage at or after operation.	Condition of organ removed.	Remarks.
Death during the operation from hæmorrhage from the renal vessels	Furious at	Right atrophied, with attached paranephritic sarcoma	Tumour weighed 2200 grm. (nearly 5 lbs.), was 22 cm. long by 14 broad, 11·6 thick; it commenced at the hilus and spread into the kidney.
Death on 2nd day from septic peritonitis	Severe during, from the spermatic vein	Whole organ a vast sac, showing only traces of renal tissue	Diagnosis not certain until removal was nearly completed. Although the dressing is stated to have been Listerian, spray only contained 1 per cent. of carbolic acid.
Death on 10th day from peritonitis	None during or after	Greatly distended pelvis, with remains of renal tissue at upper part	Patient rallied well from the operation, showed no signs of urinary troubles at any time. Went through the usual course of peritonitis, temp. only reaching 101°. Error of diagnosis recognised on opening abdomen. Calculus jambed in upper part of ureter.
Death on 2nd day from failure, owing to wound of left pleura and sudden collapse of lung; wound of pleura admitted little finger	Severe during, from lumbar wound; oozing from renal tissue	Saccular and dilated; kidney imbedded in dense inflammatory tissue; no calculi	The left 12th rib was only rudimentary, 3½ cm. long; hence the incision was carried up nearly to the border of the 11th rib on supposition that it was the 12th, and so the pleura was opened. During a second ligation of part of kidney tissue collapse came on with feeble pulse.
Recovery complete in 16 months	None at, or after	Dilated into a large sac with small adherent calculi	The renal abscess was first opened Sept. 9th, 1877, and drained. The second operation (nephrectomy) was called for to rid patient of dangers of constant septic fever from retained pus as the resulting lumbar fistulæ closed. Convalescence after second operation slow, owing to large abscess in the pelvis from perinephritic mischief, which had eventually to be drained into the rectum.

in vol. lxiii of the 'Transactions,' pp. 208 et seq.

No.	Operator and original record.	Sex, age, state.	Diagnosis or aim of operation.	Evil dates back.	Date of operation	Seat of incision.	Form of dressing.	Treatment of pedicle.	Symptoms after operation.
34	Billroth (Vienna), 'Wiener Med. Wochens.,' No.28, 1880	F., 35 years, four children by second marriage	Abdominal tumour, probably left ovarian	3 years	1879 1st Apr.	Linea alba, 11½ in. long	Antiseptic, with thymol spray	Ligatured	Rapid disappearance of shock. On 2nd day peritonitis began; increased on 3rd and 4th; no bad urinary symptoms
35	Lossen (Heidelberg), 'Deutsche Zeitsch. f. Chir.,' Bd. xiii, H. 3, 4, 1880	F., 37 years, 3 months before 9th pregnancy	Tumour of right ovary diagnosed, no trace of urinary symptoms being present	1 year	1879 11th Aug.	Linea alba, from above umbilicus to near pubis	Antiseptic, carbolic spray	Ligature of ureter first, later pedicle with No.2 silk, not by transfixion	Shock from loss of blood and carbolic intoxication; abortion 12 hours after operation; feverish; on 6th day endometritis
36	Czerny (Heidelberg), 'Archiv f. Clin. Chir.,' Bd. xxv, H. 4, p. 858	F., 37 years	Hydronephrosis, rt. very movable, probably malignant	7 mos., rapid increase for 8 weeks	1879 6th Oct.	Linea alba	Antiseptic. Listerian	Ureter and 3 vessels ligatured, also the pedicle in two portions, with silk; cut short	None mentioned; apparently there were none
37	Barker (London), 'Trans. Med. and Chir. Soc.,' vol. lxiii, 1880	F., 21 years, anæmic	Encephaloid of rt. kidney, tumour noticed 3 months	8 mos.	1879 23rd Dec. last- ed 1½ hour	Linea alba, 7 inches long	Strictly Listerian antiseptic	Transfixed & tied twice, vessels separately after, silk cut short	No shock, but vomiting continued to the last; senses clear throughout
38	Thornton (London), 'Brit. Med. Jour.,' 1880, vol. i, p. 71	F., 7 years	Hydronephrosis or hydratid of rt. kidney	5 yrs., tumour in abdomen	1880 2nd Jan. last- ed 1½ hour	Linea alba	Strictly Listerian antiseptics	Vessels tied separately, then <i>en masse</i>	None, except nausea from carbolic intoxication
39	Lucas (London), 'Transact. of Int. Med. Cong.,' 1881	M., 34 years, wasted and worn out	Tubercular kidney with fistula in loin	Sinus in loin 6 yrs., following lumbar abscess	1880 17th Feb.	Lumbar transverse	Carbolic solution	Carbolised silk	Very little shock; no cause for anxiety until secondary hæmorrhage set in

Result, immediate and eventual.	Hæmorrhage at or after operation.	Condition of organ removed.	Remarks.
Death on 5th day from peritonitis, without evidence of urinary disturbance; urine abundant from the first, 1000 c. cm. on last day	Free at first from tumour, and during, none after	Healthy kidney attached to a retroperitoneal myofibroma, very vascular, and weighing 18 kilos.	Nephrectomy was not designed here, the kidney being removed with the mass because adherent. Death plainly resulted from peritonitis alone. The tumour lay between the layers of the broad ligament unconnected with any organ near. The early bleeding was from puncture of a large vein under the capsule.
Recovery perfect; returned home Sept. 25th. The amount of urine had risen to normal in 9 days, at first it was half the usual quantity	Very severe at, from pedicle, on slipping of ligature when kidney was cut away	Quite healthy, angio-sarcoma, 5-6 times the size of kidney, grew from surface of latter	A most remarkable case. The only bad symptoms were clearly due to endometritis and carbolic intoxication. The structure of the tumour was exactly the same as my own first. In this case, however, the kidney proper was perfectly intact. This was also a very movable kidney, as was my own first case, No. 37.
Recovery complete; out of bed on 30th day; no suppuration, and very little fever at any time	None mentioned	Hydro-nephrotic organ with mere traces of renal tissue; the ureter was pervious	The only other notable points about this operation was that the enucleation of the tumour was very difficult; it was removed through a vertical slit in the ascending mesocolon, two vessels requiring ligature. During enucleation the sac burst, but very little of its contents escaped into the abdomen.
Death 45 hours later, with dyspnoea and symptoms of pulmonary thrombosis, proved to be present post mortem.	None during or after, the operation was practically bloodless	Two thirds of organ converted into a mass of encephaloid	The whole operation passed off from beginning to end without any difficulty, and was only an anxious one. A similar train of symptoms to those with which patient died had been noticed two days before death.
Recovery rapid and complete; out of bed on 9th day; stitches removed on 6th. Patient shown to Med. and Chir. Society quite well	None during or after	Enormously distended cyst of right kidney, full of urinous fluid	The most notable point about this case was the difficulty of diagnosis, and also the absence of symptoms not attributable to the carbolic intoxication.
Recovery slow. Pyuria gradually less after operation, but persisted some months. Patient shown to Med.-Chir. Soc. quite well	Severe 14 days after, requiring plugging with sponge dipped in Fer. Perch.	Much puckered on surface; removed without capsule; contained many abscess cavities	The kidney was removed in two parts, being very adherent to the ribs. Present state (October, 1881): scar sound, urine free from albumen and pus. Able to work as a bricklayer.

No.	Operator and original record.	Sex, age, state.	Diagnosis or aim of operation.	Evil dates back.	Date of operation	Seat of incision.	Form of dressing.	Treatment of pedicle.	Symptoms after operation.
40	Czerny (Heidelberg), loc. cit.	M., 23 years, bad health and phthisis	Hydro-nephrosis left; tapped in 1880 in front of axillary line, 12½ pints drawn off	Probably congenital, painful 3 years, had burst 3 times	1880 9th Mar. last- ed 3 hrs.	From old fistula in front of axillary line parallel to Poupart's later prolonged up to 12th rib	Listerian through- out with drain tubes	Ureter tied, also artery and vein easily, as also 12 other vessels	Shock
41	Czerny, loc. cit.	M., 23 years	Renal calculus on left side without a trace of tenderness or swelling on that side	From child- hood attacks of pain with hæma- turia	1880 15th Mar.	Lumbar from tip of 12th rib, 12 cm. in direction of rib	Listerian antiseptics through- out with drain tubes	Ureter tied, then vein, later artery, pedicle long, easily reached, ligatures cut short	No fever or suppura- tion
42	Czerny, loc. cit.	F., 27 years, healthy	Uretero- vaginal fistula on right side	6 mos.	1880 3rd Apr.	Lumbar in direc- tion of 12th rib, 2½ cm. of which were excised	Listerian anti- septic strict	Ligature of right artery, then of pedicle <i>en masse</i> with silk, cut short, 10 used	No fever or suppura- tion
43	Couper (London), 'Med. Press & Circular,' Nov. 24th, 1880	F., 17 years, strong and healthy	Pyone- phrosis, with very etid pus	1 year; acute 6 mos.	1880 24th Apr. last- ed 2½ hrs.	Lumbar trans- verse like that for colotomy	Anti- septic	Ureter tied first with cat- gut, then the main vessels <i>en masse</i> , also an aberrant vessel	None of any note; no peritonitis, al- though the perito- neum was opened and fouled with pus

Result, immediate and eventual.	Hæmorrhage at or after operation.	Condition of organ removed.	Remarks.
Death half an hour after operation was concluded from shock, chill, and carbolic intoxication combined	Hardly any after operation; a few coagula only found in wound	Hydronephrotic and full of masses of large round-celled sarcoma	Probably the most formidable case of the kind yet attempted. "The sac filled, not only the whole of the left abdomen, but reached into the lesser pelvis and between the aorta and posterior layer of peritoneum into the right side far up under the liver and into the renal region." The sarcoma of the sac determined the excision, which was not contemplated at first. P.M. revealed glandular infiltration; tubercular deposits in liver, spleen, kidney, and lungs; old pleuritis and pericarditis.
Recovery. Healed completely in 14 days without fever or suppuration. Urine 564 c. cm. on March 16th, rose to 1682 c. cm. by 19th. All troubles relieved permanently by operation	Severe from a vein when pedicle was cut; the main artery also found untied, none after these were secured	Healthy kidney, except for some dilatation of pelvis, in which lay a calculus 1.08 grammes in weight	Remarkably accurate diagnosis. Kidney easily reached; stone not felt in it at first; organ separated easily from perirenal fat; pedicle quite accessible; vessels tied individually in two places. Kidney larger than usual, <i>i.e.</i> circa 10 oz. = 275 grms. Patient a very large man. Diagnosis based upon hæmaturia and great pain on exercise, which became at last impossible.
Recovery. Healed completely on 15th day without fever or pus; flesh rapidly gained and strength recovered. Urine on 1st day 66 c. cm., 2nd 610 c. cm., 11th 1324 c. cm. = 47 oz.	Free from an aberrant artery <i>during</i> , none after	Weight $4\frac{1}{4}$ oz. = 118 grms. healthy	Patient a very small woman, lumbar wound consequently had to be enlarged by resection of $2\frac{1}{4}$ cm. of 12th rib. Enucleation of organ very troublesome; an aberrant artery was torn at its upper end, but ceased, after some unpleasant bleeding, of itself.
Recovery slow but most complete. Out of bed on 36th day; left hospital on Aug. 8th with only a spot of granulation in flank. Patient shown in best of health at Hunterian Soc. in Nov., 1880	None during or after; operation almost bloodless	Saccular and dilated; no calculi; 3 vessels entered the organ	This operation, which I had the advantage of seeing, was most instructive. The easy removal of the organ from within the thickened peri-nephritic tissues and capsule was remarkable, also the small size of the renal vessels. Also saw patient 7 months later, when she was in excellent health.

No.	Operator and original record.	Sex, age, state.	Diagnosis or aim of operation.	Evil dates back.	Date of operation	Seat of incision.	Form of dressing.	Treatment of pedicle.	Symptoms after operation.
44	Czerny. Note to reprint of cases loc. cit.	F., 40 years	Cystic degeneration of lower end of right kidney; latter tolerably movable	1880, 3rd May	—	Linea alba	—	—	No bad reaction until second week
45	Barker (London), present paper	F., 32 years, feeble, anæmic, 12 years, married, childless	Pyonephrosis, probably caused by impacted calculus	Renal pain since childhood, swelling noticed 1 month	1880 5th July aspirated on 3rd, last- ed 1 1/2 hour	Lumbar oblique downwards, forward from middle of 12th rib	Listerian strictly	Silk ligature, pedicle tied in two parts, found insecure p. m., adequate while alive	Extreme shock
46	Barker (London), present paper	F., 38 years, married, childless, weak, anæmic	Calculus pyelitis was known to exist, stone having been touched with a needle	15 mos., pain and swelling 12 mos.	1880 5th Oct., last- ed 1 1/2 hour	Lumbar oblique 5 inches from middle of 12th rib	Listerian strictly	Single silk ligature, including a part of the organ	Great shock
47	Lefort, 'Bull. d. l'Acad. d. Med.,' 1880, p. 1185	M., 23 years, un-healthy	Renal fistula in loin, the result of a wound	8 mos.	1880 20th May, last- ed nearly 1 hr.	Lumbar, vertical rib excised	Com-presses dipped in sp. camp.	Ligature tied with a double knot	Constant vomiting and pain
48	Spiegelberg (Breslau), 'Inaug. Dissertat.,' v. H. v. Ostoja Lniski, 1880	F., 27 years, healthy, never pregnant	Hydronephrosis, right, no cause found before operation, afterwards an ureteral valve	10 years, tumour 3 years	1880 29th May, last- ed 1 hour	Linea alba	Listerian strictly, lasted 1 1/2 hours	1 large artery and 2 veins ligatured with silk together	Prolonged suppuration, fever, sloughing of edges of abdominal incision around ligatures

Result, immediate and eventual.	Hæmorrhage at or after operation.	Condition of organ removed.	Remarks.
Death on 49th day of pyæmia without peritonitis, all being well with the abdomen; abscesses formed in parotid gland, over the sacrum, and in lungs	—	—	—
Death from shock 4 hours after operation	Free general oozing during manipulation outside capsule, hardly any when kidney was reached	Saccular, dilated to a large extent; a small calculus found in mouth of ureter	The difficulty of removal was much enhanced by the attempt to remove the kidney with its thickened capsule, &c. The great vascularity of the latter and its wide-reaching attachments involved much loss of blood in the stage. On regularly enucleating the organ later no blood was lost, and there was no special difficulty except in tying the pedicle.
Death from shock 12 hours after operation	None of any note at or any after	Somewhat sacculated with ulceration	The great difficulty here was to clear the root of the organ, which was hopelessly imbedded in a mass of fibrous tissue; as this could not be done sufficiently to justify cutting away the kidney the latter was left <i>in situ</i> to slough away. It was found p.m. that the colon adhered to the kidney and had had to be torn off in clearing the latter, and was at this point sloughy and perforated.
Death in 50 hours, due to constant vomiting	—	But slightly altered	It was found impossible to remove the organ with its thickened and inflamed capsule: it was therefore shelled out of the latter without difficulty, and the vessels tied.
Recovery slow, owing to persistent suppuration, which lasted to Nov., 1880; cause apparently ligatures. (Patient left hospital in Aug., 1880)	None at or after	Healthy on the whole, though enlarged with adherent fat about the hilus	Secretion of urine was never affected in this case. The ligatures came away on July 20th, Sept. 19th, Oct. 11th, 13th and 14th, Nov. 25th; after this date there was much improvement. When last seen, Nov., 1880, urine was abundant, sp. gr. 1008—1010, free from albumen or sugar.

No.	Operator and original record.	Sex, age, state.	Diagnosis or aim of operation.	Evil dates back.	Date of operation	Seat of incision.	Form of dressing.	Treatment of pedicle.	Symptoms after operation.
49	Meckel (Germany), 'Bayr. Med. Intellig. Bltt.,' 1879, No. 21	F., 28 years	Movable right kidney, with great pain	—	—	Linea alba	Anti-septic	Vessels and ureter tied carefully with carbol. silk cut short	Constant vomiting of fluid containing uric acid and ammoniacal combinations
50	Byford (America), 'Trans. Amer. Gynecol. Soc.,' 1880, p. 71	F., 39 years, married 18 years, 6 children, unhealthy	Encephaloid of kidney, right	18 mos.	1878 14th Mar.	Linea alba, 7 inches	Strictly Listerian	Ligatured in 3 parts with silk cut short	None of note
51	Lange (America), 'N. York Med. Record,' vol. xviii, No. 6	F., 47 years	Pyonephrosis, right	3 years, attacks of pain, nausea	—	Lumbar	Strictly anti-septic	—	—
52	Cartwright (mentioned by), 'Lancet,' 1880, vol. i	M.	Prolapse of kidney owing to wound in loin	—	—	Lumbar	Dressed with pigeon's dung	Ligatured <i>en masse</i>	None
53	Stockwell (Bath), 'Med. Press and Circular,' Nov. 24, 1880, and private notes of operator	M., 54 years, healthy until 14 years ago	Calculus pyelitis	33 years, passed calculi 26 years ago	1880 2nd June	Lumbar, oblique, midway between ribs and c. ilii	Strictly Listerian with sponge in wound to stop oozing	Vessels tied separately with silk; also ureter	Shock and vomiting, pain and restlessness
54	Baker (London), 'Trans. Inter. Med. Congress,' 1881	F., 7 years, delicate	Tubercular kidney	Nearly 2 years, attack of hæmaturia	1881 22nd Feb.	Lumbar	Lint and cotton wool	Ligature (silk) <i>en masse</i> , came away 9th day after operation	Exhaustion, but soon improving

Result, immediate and eventual.	Hæmorrhage at or after operation.	Condition of organ removed.	Remarks.
Death from uræmia on 5th day	—	Weight 145 grms., fatty	The liver and left kidney were in a state of fatty degeneration. Before operation urine free from albumen, feebly acid, sp. gr. 1005; after operation also free from albumen.
Recovery rapid and com- plete	None	4½ lbs., encephaloid throughout	After some days fetid pus escaped from lower end of incision, and abdomen had to be washed out, but this did not prevent recovery. The tumour was very move- able. Patient was last seen July, 1880, in perfect health.
Death 64 hours after from absence of all renal tissue on both sides.	Quite incon- siderable during	Double bulk of a normal kidney, $\frac{2}{3}$ upper en- larged, lower $\frac{1}{3}$ cystic, with concretions	The opposite kidney was completely de- stroyed by old suppuration, its ureter being obliterated: it consisted of a cyst filled with cheesy matter; "no symptom indicated disease of the left kidney." There were many adhesions round the organ removed.
Recovery rapid and com- plete; in 2—3 weeks man was walking about	—	Normal	This case occurred in China, where a native received a slash in the loin, and came to an American ship's surgeon with the kidney protruding from the wound, having had it dressed beforehand with bird's dung. The surgeon removed it after ligature.
Death 10 hours after the operation of hæmorrhage from renal vein	Severe 10 hours after from right vein causing death	Much en- larged, saccu- lated, weight 10 oz., and imbedded in in dense fibrous tissue	The dense mass of fibrous tissue envel- oping the kidney made its removal extremely difficult, some of it coming away adherent to the organ, and bringing a small por- tion of the peritoneum with it. The chronicity of the affection accounts for the development of this dense material.
Recovery	None of any note at, or any after	Tubercular, weight 2½ ozs.	Nephrotomy had been performed 2½ months previously without benefit. Kidney was removed from within capsule. Six months after nephrectomy still some pus in urine.