

**Cases illustrating some interesting points in the pathology and surgical treatment of renal colic, haematuria, intermittent albuminuria, and transitory hydronephrosis / by David Newman.**

**Contributors**

Newman David, 1853-1924.  
Royal College of Physicians of Edinburgh

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CASES ILLUSTRATING

SOME INTERESTING POINTS IN  
THE PATHOLOGY AND SURGICAL  
TREATMENT OF RENAL COLIC,  
HÆMATURIA, INTERMITTENT  
ALBUMINURIA, AND TRANSITORY  
HYDRONEPHROSIS.



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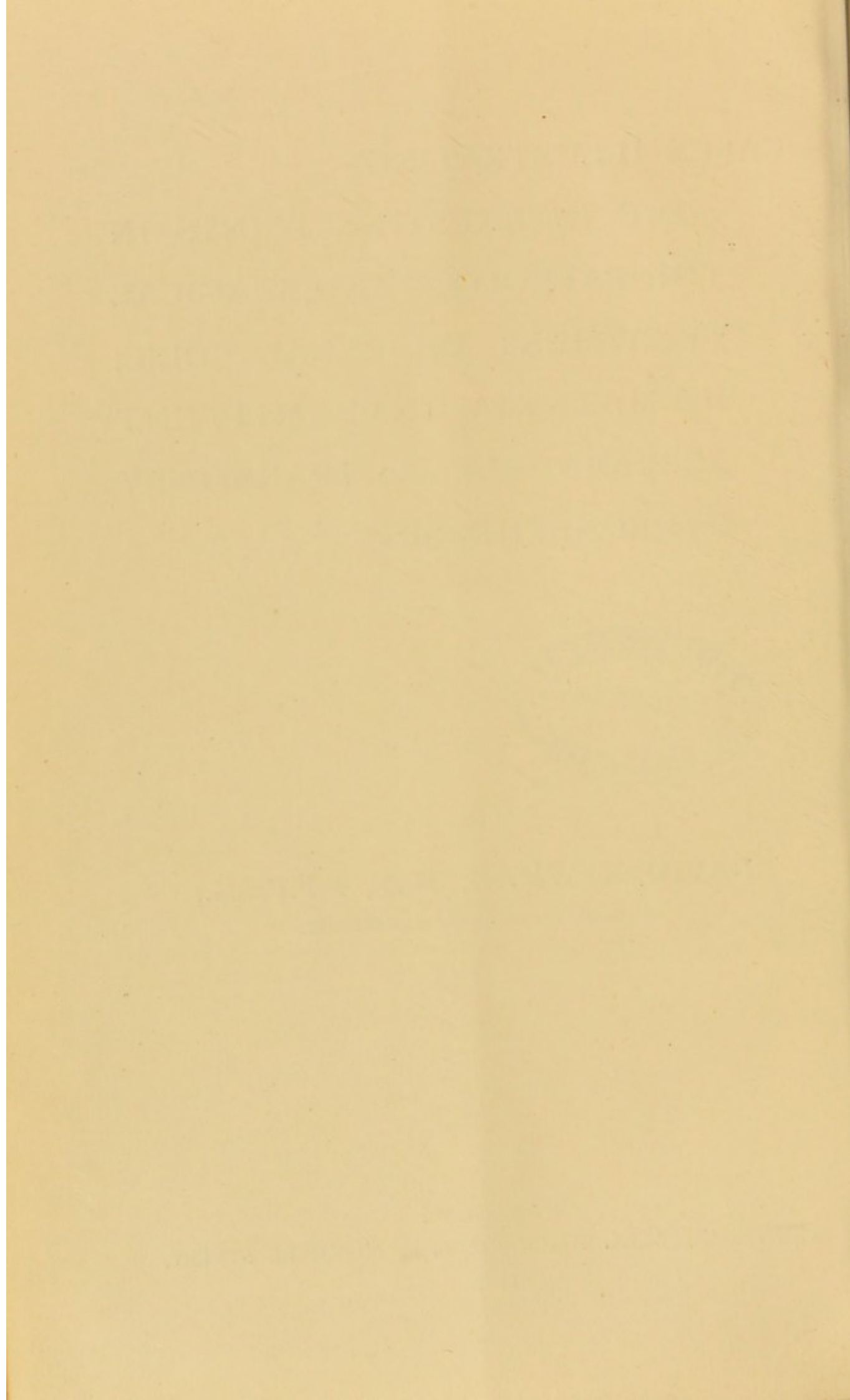
DAVID NEWMAN, M.D., F.F.P.S.G.,

SURGEON, ROYAL INFIRMARY, GLASGOW.

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INCREASED VASCULAR  
A CAUSE OF  
AND ALBUMINURIA  
CASTS; SYMPTOMS  
TREATMENT.

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*INCREASED VASCULAR TENSION IN THE KIDNEY  
A CAUSE OF RENAL PAIN, HÆMATURIA,  
AND ALBUMINURIA, WITH OR WITHOUT TUBE-  
CASTS; SYMPTOMS RELIEVED BY SURGICAL  
TREATMENT.*

THE causes of increased vascular tension in the kidney may be divided into two classes, namely, those that are chiefly mechanical, and those produced by some morbid process. The first four cases are brought forward to illustrate the way in which the circulation of the kidney may be interfered with by direct mechanical obstruction, while the remaining three show how the relief of tension due to morbid conditions may benefit the patient.

Torsion of the renal vessels and of the ureter may lead to one or more of the following symptoms, and the cases will illustrate the presence of these in various degrees:—

1. Dull aching pain in the renal region almost constantly present, and associated with occasional paroxysms of colic similar to that produced by calculus.

2. Hæmaturia, sometimes coincident with blood-casts in urine.

3. Albuminuria, with or without tube-casts in urine.



CASE I.—*Movable Kidney, Enlarged and Hyperæmic from Torsion of Renal Vessels and Ureter, caused by Strain—Symptoms: Severe Paroxysmal Renal Pain, Hæmaturia, Gastric Disturbance, &c., simulating those of Renal Calculus—No Albuminuria independent of Blood—Operation—Cure.*

R. C., marine engineer, aged 40, consulted me in May, 1895. According to his statement, he first suffered from pain in the right side in 1891. This pain followed a severe strain in the lumbar region, caused by a sudden roll of the steamer, while patient was entering the man-hole of a boiler. The edge of the man-hole caught him just under the right ribs. Coincident with the attack of pain he noticed a quantity of blood in his urine, and the hæmaturia continued for several days, and then gradually disappeared. The pain in the lumbar region was so severe that he had to avoid work for over three weeks, and even after that time he required to be very careful not to over-exert himself, otherwise both the pain and the hæmaturia returned. This condition had continued during the last four years.

When seen by me he appeared a well-nourished man, but he said that the pain in the kidney was so constant that he was quite unfitted for his work at sea. The pain was generally dull, and sometimes only amounted to a sense of weight on the affected side. When he was at rest, he had little or no discomfort, but severe suffering was readily brought on by any sudden movement of the body. At first the pain was limited to the right renal region, and continued so for about two years, but when first seen by me it extended along the course of the ureter, to the perinæum and the testicle, and on rare occasions it passed over to the opposite renal region. Not infrequently the renal pain came on very suddenly, and was accompanied by very severe gastric disturbance, nausea and severe vomiting, faintness, and

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gastrodynia. When the sickness passed off, the patient endeavoured to relieve himself by contortions of the body, and usually the pain subsided as suddenly as it commenced. Complete rest afforded marked relief to his suffering, and if he avoided active exercise of any kind, the pain and hæmaturia seldom troubled him.

The urine when free from blood was strictly normal, but when hæmaturia came on the blood was intimately mixed with the urine, to which it imparted a dark smoky-red colour, and the quantity of albumen present was in proportion to the hæmoglobin. No coagula, tube-casts, or histological elements of significance were found in the urine at any time. There was no suppression of urine, but during the attacks the urine was concentrated, and when these passed off the urine was dilute and copious. He was well-nourished, and the muscles highly developed, so that physical examination did not reveal the condition of the kidneys, nor did percussion give any satisfactory results. Pressure over the right renal region caused some pain.

I advised the patient to take six months' rest and then to report progress. In December, 1895, he consulted me again, and said that when he took complete rest he was free from pain, but if he used any liberty in the way of exercise he nearly always induced an attack of pain.

Considering all the facts of the case I advised him to have the right kidney explored; he consented, and the operation was performed at a private home in Glasgow on 17th January, 1896.

With the assistance of Dr. E. A. Gibson the kidney was exposed by a lumbar incision, and on opening the adipose capsule the right kidney was found not only to be movable but rotated, so that, even when the patient lay on his left side, the upper extremity of the organ pointed forwards. On



carrying the fingers round the fibrous capsule the fatty tunic was found to be only slightly adherent, and the pelvis was dilated to a moderate degree. The ureter was easily made out with the finger, and was found to be kinked over the renal vessels, and the kidney itself was observed to be enlarged, swollen, and engorged with venous blood. The fibrous capsule was exposed and incised along the outer border of the kidney, stripped off the cortex for a third of an inch all round the incision, and sutured to the parietes.

When the fibrous capsule was incised the soft cortical substance of the kidney pouted through the incision, and on separating the capsule free bleeding occurred. The superabundant fat was also removed, and the remaining adipose capsule was sutured to the muscular wall in such a way as to fix the kidney as high up as possible, and so as to maintain the normal relationship of the ureter and renal vessels. A large rubber tube was inserted along the depth of the wound in order to promote adhesions.

The patient made a good recovery, and since the operation he has had no return of the symptoms.

He reported himself in perfect health on the 28th October, 1896, having followed his occupation at sea since the beginning of March.

*CASE II.—Severe Paroxysmal Renal Pain and Hæmaturia without Gastric Disturbance—Occasionally Blood-casts in Urine, frequently Tube-casts, and sometimes Albumen independent of Blood—Movable Displaced Kidney—Cured by Operation.*

T. L., aged 50, an ironmoulder, was sent by Dr. John Service, of Mossend, to the Royal Infirmary, 30th January, 1893, complaining of severe pain in the region of the left kidney shooting downwards and forwards in front of the

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abdomen. These paroxysms of pain usually came on after exercise and lasted for several minutes at a time, while during the six months prior to admission he almost constantly suffered from an aching pain in the left side. At the onset of the attacks of paroxysmal pain the urine was of a dark red colour, and contained a large quantity of blood, but gradually the quantity of blood diminished, and the urine became bright red.

The patient was a very well nourished man, short in stature, weighed  $14\frac{1}{4}$  st., and very stout, so that examination of the renal region with the hand did not reveal anything; even firm pressure applied to the part did not give pain, and no increased muscular resistance could be made out. During residence in hospital the patient was kept strictly in bed, and from 30th January till 6th March he only complained of the dull aching pain; he had no paroxysmal attacks, and no hæmaturia or albuminuria. He was readmitted on the 8th of May, 1893, having suffered from several attacks since he left the hospital in March.

During all these acute attacks the pain was not limited to the loin, but extended down the left ureter, to the testicle, to the inner aspect of the thigh, and sometimes even to the hip. Frequently a change in position modified the pain, but marked relief to suffering was afforded only by complete rest in bed, and to this the patient had often to resort.

On the 10th May, the following note was made:—"Until the present time the symptoms all pointed to the presence of a stone in the left kidney. The pain was clearly increased by exercise and relieved by rest, and so also was the hæmaturia. Yesterday he had an attack of renal colic and hæmaturia, and the following is a note of the condition and quantity of the urine:—



1893.	Ounces of Urine.	REMARKS.
May 9, 6 P.M.,	12	Urine clear; trace of albumen; a few tube-casts. No pain. Sp. gr., 1013.
„ 10 P.M.,	4	Pale urine. Sp. gr., 1020.
„ 11 P.M.,	...	Severe paroxysm of pain in left side.
May 10, 5 A.M.,	6	Urine dark porter colour. Sp. gr., 1024. Blood abundant. Blood-casts. Pain still continues severe.
„ 8 A.M.,	18	Pale red blood-stained urine. Sp. gr., 1008. Pain gone.
„ 12 Noon,	15	Trace of blood only. Small quantity of albumen. Sp. gr., 1011.
„ 7 P.M.,	9	Clear urine. Sp. gr., 1015. No albumen; no tube-casts.

The presence of blood-casts in the urine suggests the source of hæmorrhage as being in the renal substance rather than the consequence of a calculus in the pelvis of the kidney. It must be remembered, however, as pointed out by Dr. James Finlayson in a paper on the occurrence of tube-casts in non-albuminous urine,<sup>1</sup> that tube-casts are found in the urine in cases of renal calculus and gravel, with complete absence of albumen in cases free from nephritis.

*19th May, 1893.*—The patient remained well, and since 8 A.M. on the 10th inst. there has been no pain, and no blood, tube-casts, or albumen since 7 P.M. on the same day.

The presence of blood-casts in the urine was observed for the first time on the 10th of May, and gave quite a new aspect to the hæmaturia, which prior to this time was regarded as due to the presence of a stone in the left kidney.

The patient remained well till the 1st June, when he left the ward, not having had any recurrence of pain or of hæmaturia.

*Readmitted 22nd June, 1896.*—Since leaving the hospital in June, 1893, the patient has suffered more or less pain in

<sup>1</sup> *British and Foreign Medico-Chirurgical Review*, 1876.



the region of the left kidney, which is increased by exercise and relieved by rest in bed. The pains and the hæmaturia present the same characteristics as formerly, but now there is considerable tenderness on palpation at a spot midway between the crest of the ilium and the last rib on the left side. On account of the stoutness of the patient palpation fails to reveal the condition of the left kidney.

Considering that rest in bed only gave temporary relief, and that the patient was incapacitated from following his occupation by the frequency of the attacks, he was advised to submit to an operation for the purpose of ascertaining the precise condition of the left kidney, and if possible of relieving it permanently.

On the 29th June an incision was made down to the left kidney, when it was found to be moderately movable, displaced upwards and forwards, and rotated on its short axis, so that the lower margin of the organ pointed forwards.

The adipose capsule was freely separated from the fibrous covering of the kidney, and a considerable portion of the loose fat removed. The fibrous capsule was then incised, stripped off the cortex for half an inch on either side of the incision, and stitched to the parietes. A large drainage-tube was inserted, and the deep parts of the wound kept open for ten days, after which it was allowed to heal.

In this case the symptoms—viz., paroxysmal renal pain increased by exercise and relieved by rest; hæmaturia, tenderness on palpation in the left renal region—all pointed to calculus in the kidney, but the presence of a few tube-casts, traces of albumen, without pus or blood, indicated that the morbid condition affected the tissue of the kidney, while the occasional appearance of blood-casts pointed to the origin of the hæmorrhage. At the operation a sufficient explanation was found. The rotation of the kidney, so that



the lower margin presented forwards, must have caused the ureter and blood-vessels to be coiled round one another, and so impeded the circulation of blood. As a consequence, more or less severe passive hyperæmia was produced, varied in degree according to the precise position occupied by the kidney at different times.

The patient reported himself on 2nd November, 1896, and stated that while occasionally he has had slight pain in the cicatrix, he has had no return of the old renal pain, nor has any blood appeared in the urine. A specimen of urine examined was free from albumen and tube-casts.

*CASE III.—Movable Kidney caused by Fall—Symptoms: Severe Paroxysmal Renal Pain, Sickness, and Vomiting—No History of Hæmaturia; Urine Normal between Attacks of Colic—Operation; Kidney Enlarged and Engorged with Blood—Cure.*

A. B., aged 53, was sent to me by Dr. George S. Middleton, of Glasgow, whom he consulted along with his family attendant, Dr. James Laurie, of Greenock, in June, 1896, with the history that up till five years ago he enjoyed perfect health. One night he was called suddenly, and while running on deck he tripped over a hawser and fell very heavily on his right side, and was conscious at the time of having "twisted himself." The pain in the right lumbar region, which followed the accident, was severe, and after lasting for a fortnight or so gradually improved, but did not entirely disappear. From the time of the injury till two years ago the patient has always noticed that, if he lay in bed upon his left side, on rising in the morning he suffered from a dull aching pain in the right lumbar region, which only became relieved when he walked about for a quarter of an hour or twenty minutes.



Till the summer of 1894 this condition of matters continued, but about that time the pain became much more severe, the attacks were more frequent and often lasted the greater part of the day, and did not readily disappear on walking about. In 1895, while at San Francisco, he was seized with a severe paroxysm of pain, which came on suddenly in the right renal region and extended down the groin and to the testicle, and was accompanied by severe sickness, sweating, and vomiting. After this first attack, which, from his description, resembled renal colic, he had several others, and the longest interval between them was two months. Between the paroxysms of acute pain he suffered more or less from the old dull pain in the right renal region. In March, 1896, while in Hull, he suffered from a very severe attack which lasted for over eight hours. This was the last previous to the operation, but they had become so frequent and severe that he was determined to have something done for his relief.

When examined, the patient was found to be a very well nourished healthy-looking man, the muscular development being so good that little could be made out by palpation further than that the muscular resistance was much greater in the right than in the left lumbar region, and pressure over the right kidney caused considerable pain.

The urine was at all times strictly normal when I examined it, but I had no opportunity of seeing it during a severe attack.

I advised an exploration by lumbar incision, to which he consented, and the operation was performed in a private home in Glasgow, in July, 1896.

On exposing the right kidney the cortex was found to be deeply injected with blood; the organ was enlarged and moderately movable. In separating the adipose tunic several large veins were torn, but no torsion of the ureter or vessels



could be made out. A considerable portion of the adipose capsule was removed, and in all respects the operation was performed in the same way as in Case I.

The patient made a good recovery, and on 3rd November, 1896, reported himself perfectly well since the operation.

CASE IV.—*History of Injury causing Movable Kidney, Renal Pain. Emaciation, and occasional Suppression of Urine from Torsion of Artery and Ureter—No Tube-casts, Hæmaturia or Albuminuria—Cured by Operation.*

N. O., aged 49, came under observation in 1882. Prior to this the patient, who was at one time very stout, had been emaciating. He had suffered a good deal from chronic bronchial catarrh, attended with considerable muco-purulent expectoration which, on microscopic examination, was found occasionally to contain a few blood-corpuscles and a considerable quantity of pus. The physical signs were indicative of chronic bronchitis accompanied by slight emphysema, without bronchiectasis.

The history of the case, as far as the movement of the kidney is concerned, dates from the beginning of the year 1882. He was out riding one day, when his horse stumbled, and he fell on his right side and fractured two of his ribs (the ninth and tenth left). He was kept in bed for a fortnight after the accident. During this time he complained of pain on the right side, immediately below the edge of the liver. The practitioner attending him at that time suspected an abscess, and treated him accordingly. While he remained in bed he did not notice any swelling or tumour on the right side, but after he got up he discovered a movable tumour seated in the hypochondriac region. At first he complained of pain in the right renal region, attended with vomiting and sometimes followed by diarrhoea.



The pain usually came on suddenly and lasted for five or six hours. He noticed that if he took much exercise, or if the bowels were constipated, he was more apt to have an attack. When he took to bed the symptoms soon disappeared, but, on the other hand, if he continued to take even moderate exercise the pain caused him considerable inconvenience.

He was greatly emaciated, and for a man the belly was loose and pendulous. Palpation of the abdomen revealed the presence of an oval swelling immediately under the lower edge of the liver, and about 2 inches from the umbilicus. The swelling could be freely moved about in the abdomen, and pushed down into the pelvis, upwards under the edge of the liver, and an inch to the left of the middle line. Percussion over the right renal region or over the swelling did not yield any satisfactory results, but when the right loin was examined, the kidney having previously been displaced, a distinct flattening could be made out. When the swelling was handled a sickening sensation was experienced, resembling, as the patient informed me, the pain produced when the testicle is squeezed.

A careful examination was made with the object of detecting pulsation of the kidney or of the renal artery, as this case appeared to be a very favourable one for this purpose on account of the thinness and looseness of the abdominal wall, but no trace of movements resembling pulsation could be made out.

The only other symptom worthy of notice was the occasional sudden suppression of urine, without any very evident cause, and without any apparent relation to the position of the right kidney. Sometimes it commenced without the organ being displaced, at least, so far as could be detected by hand, and there was no increase in the size of the organ during the time this symptom was present.



The only explanation I can give for the scanty secretion of urine, is to suppose that the kidney was rotated on its short axis, so that the ureter and blood-vessels were coiled round one another, and the passage of blood to and from the kidney was thereby prevented. This condition would lead to a very marked engorgement of the kidney on the affected side, while it might also induce reflex spasm of the blood-vessels in the opposite organ, and so bring on suppression, just as the use of a catheter may cause the excretion to cease for a time.

When the secretion again became active, the urine passed did not differ from what was voided at other times.

The following table will show the quantities and specific gravities of seven samples collected during one of the attacks. There was no urine passed between 11 A.M. on the 28th and 1 A.M. on the 29th of November:—

1882.	Quantity.	Sp. gr.	Urea.	REMARKS.
Nov. 28, 7 A.M.,	10 oz.	1015	1.75 p. cent.	Slight deposit of urates.
„ 11 A.M.,	8 „	1017	1.85 „	Do.
Nov. 29, 1 A.M.,	3 „	1016	1.7 „	Considerable deposit of urates.
„ 3 A.M.,	10 „	1019	1.9 „	Do.
„ 8 A.M.,	6 „	1014	1.5 „	No deposit.
„ 1 P.M.,	7½ „	1014	1.55 „	Do.
„ 5 P.M.,	10 „	1018	1.7 „	Do.

At the time the case was considered to be one of movable kidney, with torsion of the renal artery, without much obstruction to the venous return, as shown by the sudden suppression of urine, unassociated with hæmaturia, albuminuria, or the presence of tube-casts.

The patient refused to have an operation performed, and at the time (1882) I was too uncertain in my views of the case to press the matter. But the symptoms remaining



unabated till 1888, I then performed nephrorraphy with a good result.

In the three cases first described, some of them under observation for a considerable period, the first diagnosis formed was that of renal calculus. The paroxysmal pain increased by exercise and relieved by rest in bed, the hæmaturia in the first two cases and the general gastric disturbance in all, were similar in character and mode of onset to what is observed in calculous disease of the kidney. But in these cases, in addition to and coincident with the symptoms just mentioned, there was sudden diminution in the quantity of urine, while the subsidence of the renal pain was soon, but not immediately, followed by a copious flow of urine of high specific gravity, instead of low as in transitory hydronephrosis. The hæmaturia associated with blood-casts in the urine, and the renal pain concurrent with the sudden appearance of albumen and tube-casts, are important circumstances in forming a diagnosis.

From these cases it is evident that when the kidney becomes displaced the vessels, the nerves, and the ureter may become so twisted together that the circulation of blood is seriously interfered with for the time being. In Case I the kidney was found to be displaced at the time of operating, and the ureter kinked over the renal vessels, while the kidney itself was seen to be greatly engorged with venous blood. In the fourth case evidently the arterial circulation alone was interfered with.

Mechanical obstruction may lead to very marked vascular tension in the kidney, which tension may be revealed clinically by the presence not only of albumen but also of tube-casts in the urine.

Three cases will be considered further on in which



the symptoms pointed to torsion of the renal vein as well as of the ureter, causing not only hydronephrosis, but also considerable albuminuria and the presence of tube-casts (Cases VIII, X, and XI).

All the cases referred to above seem to have an important bearing, not only upon the pathology of albuminuria, but also on the treatment of it in certain cases.

Interference with the venous flow produces two changes in the urine—(1) a diminution in the quantity and (2) the passage of albumen and the corpuscular elements of the blood.

The pathology of these cases must be discussed separately from those that are to follow, as the conditions appear to be entirely different.

It is manifest that in such displacements of the kidney as those described, we have to deal with a passive hyperæmia of the kidney due to local causes. In some instances the obstruction may be entirely venous, in others the arterial circulation may also be interfered with, either as a consequence of direct pressure or from spasm of the vessel's wall. It has been proved by experiments upon animals that when the venous flow is impeded, the quantity of blood flowing through the kidney is diminished, and as a consequence the amount of urine excreted immediately decreases. Coincident with the diminution in quantity of the excretion there is a concentration of the urine, which soon becomes albuminous also, and should the hyperæmia be intense, blood corpuscles, tube-casts, or even blood-casts may appear in the urine.

When the efferent resistance is made greater from any cause, the veins and the venous radicles surrounding the uriniferous tubules will become distended; this increased resistance to the flow of blood will lead to an augmentation of the blood-pressure within the glomeruli, but at the same time, by diminishing the total quantity of blood flowing



through the organ, the venous obstruction will cause retardation to the excretion of urine.

The absolute pressure of the blood in the glomeruli is only one factor in determining the quantity of urine excreted; the rapidity of the flow is even of greater importance, and the kidney being provided with a rigid capsule the engorgement of the veins must produce considerable pressure upon the uriniferous tubules, and so augment the pressure of the fluid in Bowman's capsules. This compensates to some extent for the increased tension of the blood in the Malpighian tufts.

The backward fluid pressure of the urine so produced doubtless induces an œdema of the organ, and probably a partial absorption of the already secreted urine, as indicated by an engorgement of the lymphatic spaces, but when the obstruction to the vein is removed the venous radicles empty themselves quickly, and the œdema rapidly disappears.

As regards the passage of albumen and the corpuscular elements of the blood, long ago Mr. George Robinson, in a paper read before the Royal Medical and Chirurgical Society of London in 1843, demonstrated by experiments upon animals that obstruction to the renal vein caused both albuminuria and hæmaturia, and these abnormal constituents appeared in the urine within a very short time after the obstruction took place, in some instances within three or four minutes. Senator also by experiments proved that by obstructing the renal vein for a short time in a living animal, albumen and blood corpuscles could be easily detected in the straight tubules, while Bowman's capsules were free; but if the pressure were more prolonged, the mechanical hyperæmia caused blood to escape into the Malpighian capsules also.

From these experiments it is easily seen how blood-casts, blood corpuscles, and albumen may appear in the urine in the



cases described above, and from other observations it has been shown that the slower the circulation becomes the larger will be the amount of abnormal constituents in the urine.

Not only does venous obstruction produce those changes in the urine, but compression of the renal artery may also be followed by suppression of the excretion. Hermann and Overbeck demonstrated that even slight disturbance of the renal circulation causes suppression, which may last for a longer or shorter period according to the sensitiveness of the individual, and that albumen and blood may appear in the urine for hours or days thereafter. We also know that arterial obstruction is an important cause of venous hyperæmia, and with the possibility of having venous pressure combined with arterial disturbance of the circulation we have in movable kidney a most productive cause of suppression of urine followed by hæmaturia and albuminuria.

I believe that not only in the cases referred to here, but in many others the retardation of the glomerular circulation by venous engorgement is the chief factor in the causation of suppression of urine and some forms of albuminuria; and, consequently, relief of tension may give immediate ease to the patient and restore the function of the kidneys.

General experience, I think, has shown that the vascular tension produced by mechanical venous obstruction or by inflammatory engorgement cannot be relieved permanently by drugs, while it can be rapidly alleviated and serious consequences avoided by surgical treatment. Free incision or local bleeding is clearly indicated in such cases; and in all cases of increased vascular tension of a tissue, whether the one or the other method should be employed depends upon the immediate cause of the tension and the anatomical structure of the organ or part involved.



The attention of the profession has been directed to the subject of "albuminuria associated with kidney tension" by a very interesting and admirable paper published in the columns of the *Lancet* on the 4th of January of this year, by Mr. Reginald Harrison, and also by his address as President of the Medical Society of London, 12th October, 1896. In his first contribution he makes the following observation:—"Since the introduction and the more general adoption of direct exploration of the kidney through an incision from the loin, or otherwise, a certain proportion of cases have been met with where it failed to reveal any obvious cause for the symptom or symptoms which led to the adoption of the proceeding. It has, however, been frequently noticed that such cases are often completely and permanently cured by what was done." He then cites three cases in illustration. The first, an instance of post-scarlatinal nephritis; the second, a nephritis from exposure to cold and damp; and the third case, one of sub-acute nephritis following influenza, and in all of these he believed that considerable benefit was derived from the relief of renal tension by incision of the kidney. The details of the cases are not sufficiently complete for the reader to form an independent opinion from the facts stated, but from what I have seen of other cases I am willing to admit the justness of Mr. Harrison's conclusions as applied to the effects of increased vascular tension on the kidneys and their excretions.

In corroboration of Mr. Harrison's view that inflammatory hyperæmia may lead to considerable pain in the kidney accompanied by albuminuria, and relieved by incision, the following cases may be quoted:—



CASE V.—*Sudden Suppression of Urine, Albuminuria, Renal Colic—Incision of Kidney Followed by Relief of Pain, and Disappearance of Albuminuria.*

In 1888, at the Western Infirmary, I saw a man who complained of severe pain in the loins, more severe, however, on the right side. It came on suddenly about two months previously, and at the onset was accompanied by rigors and a sudden diminution in the quantity of urine.

I ascertained from his medical attendant, the late Dr. John Moyes, of Largs, that the urine at the beginning of the attack contained albumen, but no tube-casts were discovered. Specific gravity, 1025 to 1030; but daily quantity of urea was diminished. Urine passed from 25 to 35 oz. in twenty-four hours. The patient did not complain of headache, nausea, or vomiting, and no other of the characteristic clinical features of nephritis was present, such as anasarca, effusion into serous cavities, anæmia or uræmic symptoms.

When seen at the Infirmary the urine contained a moderate quantity of albumen, but no tube-casts, and comparatively little deposit was thrown down on standing. There was a history of the passage of small oxalate of lime calculi, and of occasional hæmaturia. While under observation he had several attacks of distinct renal colic, which led me to the conclusion that he was suffering from renal calculus, and he was advised to have an operation performed in the hospital. This he refused, but consented after some delay to have it done in private. On exposing the right kidney by a free incision in the loin, the organ was seen to be enlarged, of a dark chocolate colour, and very tense. On examining the kidney with needles for the detection of a stone, free bleeding occurred, and as no calculus could be discovered with the needles I made a free incision into the pelvis in order to explore with the finger. The bleeding was very free and the



wound in the cortex had to be plugged with iodoform gauze. No calculus was found. I felt that I had made either an error in diagnosis, or that my search had been imperfect, and left the case with the belief that harm rather than good had been done by the operation; but to the satisfaction of the patient and myself he ceased to suffer any pain, the albuminuria disappeared entirely, and afterwards the patient enjoyed excellent health.

In this case, from the onset of the trouble till the time of the operation, albumen was constantly present and the quantity of urine remained considerably below the normal, but after incision the albumen disappeared and remained absent, and the quantity of the urine increased. I have no doubt that in this case the relief of tension by the incision facilitated the renal circulation.

Wet or dry cupping over the kidneys may act in a somewhat similar way.

CASE VI.—*Sudden Suppression of Urine—Pain at first Diffuse, afterwards limited to Renal Region—Albuminuria, Blood-Casts, Wet Cupping, Relief of Urinary Symptoms—Inguinal Hernia—Operation—Cure.*

Three years ago a patient, aged 62, came under observation on account of severe abdominal pain associated with sudden and almost complete suppression of urine, nausea, and vomiting, and the pain at first was not limited to any particular spot, but was complained of all over the abdomen. When seen by me the pain had considerably diminished from what it was at the onset the previous day, and physical examination of the abdomen did not cause much increase in suffering unless when firm pressure was made over the renal regions. The bowels had been moved freely, and there



was neither distension nor collapse of the abdomen; no hernia could be discovered. Only highly albuminous urine had been passed since the onset of the pain. The patient had an old stricture, but the bladder was almost empty.

## URINE.

1893.	Quantity.	Sp. Gr.	Reaction.	REMARKS.
May 20, 10 A.M.,	20 oz.	1016	Acid.	Slight trace of albumen. No blood. Pain set in at 11.30 A.M., and steadily increased till midnight.
„ 11 P.M.,	3 „	1018	„	Very albuminous. Blood drawn off with catheter.
May 21, 8 A.M.,	1 „	?		Highly albuminous. Blood-casts.
„ 10 P.M.,	4 „	1025	„	Do. do.
May 22, 10 A.M.,	3 „	1028	„	Do. do.
„ 7 P.M.,	...	...		14 oz. blood drawn off.
„ 11 P.M.,	6½ „	1020	„	Highly albuminous. Blood-casts.
May 23, 2 A.M.,	7 „	1018	„	Do. do.
„ 6 A.M.,	10 „	1018	„	Less albumen and less tube-casts.
„ 11.30 A.M.,	12 „	1016	„	Albumen and blood much less.
„ 6 P.M.,	12 „	1016	„	Do. do.

Temperature never above 100.3°; pulse average, 88, good strength; respirations, 22. Numerous blood-casts in urine. Skin moist.

From the presence of blood-casts it was evident that the source of the albumen was in the kidneys, and the suspicion was aroused as to the possibility of there being an acute tubular nephritis. Acute febrile diseases and their sequelæ were excluded, and there was no reason to suspect cardiac, pulmonary, or cerebral causes of albuminuria.

I applied wet cupping to the loin over both kidneys, and removed in all 14 oz. of blood at 7 o'clock in the evening; by 11 o'clock P.M. the patient passed 6½ oz. of albuminous urine; and during the following night 17 oz. of less albu-



minous urine were excreted, and the pain in the loins subsided. The patient remained moderately well for a day, the 23rd, when the pain in the abdomen recurred, but this time more marked at the umbilicus and on the right side just over the middle of Poupart's ligament, where there was some increased resistance and dulness on percussion. This pain rapidly became more severe, and the patient presented the appearance of a case of acute intestinal obstruction. A very careful examination was made of the abdomen, when the only abnormality to be detected was the dulness and increased resistance just referred to at the region of the right internal abdominal ring. I suspected a small strangulated inguinal omental hernia; operated and relieved it.

The patient made a good recovery, and the albuminuria disappeared in three days.

The following is an almost exactly similar case:—

CASE VII.—*Suppression of Urine (supposed erroneously to be Stricture), Hæmaturia, Albuminuria, Pain in Bladder and over Kidneys, Tympanites, Dry Cupping, followed by Secretion of Urine—Symptoms of Intestinal Strangulation.*

I reported the case in detail in the columns of the *Glasgow Medical Journal*, March, 1896, p. 218. In a patient suffering from internal strangulation of the jejunum, the lesion of the bowel was greatly obscured by the circumstance that the patient was sent to the Royal Infirmary as one of stricture of urethra associated with suppression of urine. The idea of stricture was at once eliminated, but the kidneys failed to act until dry cupping was resorted to, exactly forty-eight hours after the onset of the symptoms. The following is the report of the case:—

“The patient, J. M'L., aged 71, said to be suffering from stricture of the urethra, was admitted into the Royal



Infirmary on Tuesday, 3rd December. The patient was in his usual health until Monday, 2nd December, and passed urine quite naturally about 11 o'clock forenoon. Half an hour later a sudden pain seized him across the abdomen, but was most severe below the level of the umbilicus; two hours later the pain became acute, and continued so till admission.

"Previous to coming to the hospital he consulted two medical men, and they passed a catheter; but, failing to draw off any urine, came to the conclusion that the instrument had not reached the bladder, and that the patient was suffering from a stricture. On admission, the house surgeon attempted to introduce an instrument; but, failing to do so, Dr. Newman was asked to see the patient. On examination he found him very weak; the pulse could scarcely be felt; respiration was slow, and the temperature slightly subnormal. The patient complained of considerable pain in the region of the bladder, and the abdomen was slightly distended and tympanitic above the level of the umbilicus; below that level there was a less tympanitic note when first examined. But shortly thereafter the note varied in tone, and became quite as clear there as in other parts of the abdomen. No distension of the bladder could be detected, and on passing a catheter no urine escaped, although the instrument was clearly within the cavity of the viscus. Dr. Newman came to the conclusion that the patient was either suffering from suppression of the urine or rupture of the bladder, although admittedly there were no evidences pointing to extravasation beyond pain and tympanites. The patient said that his bowels were perfectly regular until Sunday night, but since then he had had no movement. The tongue was covered with white fur, and the patient complained very much of thirst. A large enema was given, but returned without fæces. This



was repeated the following morning without any effect. On Wednesday the patient vomited slightly, the matter vomited suggesting, by its appearance, that it was feculent, although free from any distinctive odour. The patient's general condition was improved; but still no urine had been secreted. Dry cupping was ordered to be applied over both kidneys, and this was done in the forenoon. In the afternoon about 8 oz. of urine was passed. He was cupped again in the evening, and during the night and the following morning a considerable quantity of urine was secreted. The urine contained blood and a quantity of albumen larger in proportion than the blood accounted for, also some pus, but no tube-casts.

" On the 5th December patient still complained of abdominal pain, but less severe than the day previous. The physical signs remained practically the same, but, if anything, the tympanites was less marked; pulse considerably improved since admission; temperature slightly subnormal, and bowels still unmoved. In the morning distinct fæcal vomiting set in, and Dr. Newman saw the patient again at 5 o'clock P.M. in consultation with Dr. G. S. Middleton. After carefully reviewing all the facts, the conclusion come to was that the case was really one of intestinal obstruction, complicated by suppression of the urine. Considering the age of the patient, it was deemed advisable to administer another large enema, with the patient in the knee-elbow position; but should this fail in producing any effect, an exploratory incision should be made. There was no evidence as to the position of the obstruction, and no hernia could be discovered.

" At 10 P.M. Dr. Newman, assisted by Dr. J. A. Adams and Dr. D. M'Kellar Dewar, performed abdominal section. On opening the peritoneum, the cavity was found to contain a considerable quantity of blood-stained fluid, and the lower



portion of the bowel, which presented in the wound, was in a state of advanced inflammation; the serous surface was of a dark crimson colour, and at the junction of the jejunum and ileum a constricting band was discovered, including a portion of almost gangrenous bowel. Two inches of the bowel were removed, along with a wedge-shaped portion of mesentery, and the divided segments were united by means of Murphy's buttons. The bowel above the constriction was found to be considerably distended, and the walls were greatly thickened from hypertrophy of the muscular coat. Below the constriction the bowel was almost empty, and the walls softened and atrophied, so much so that suture of the bowel was impossible. The mucous membrane of the bowel above the point of obstruction was distinctly gangrenous, but this change did not affect the other coats."

In these two cases (VI and VII) I have no doubt that in one the omental and in the other the intestinal strangulation produced reflex spasm of the renal vessels or of the walls of the ureter which led afterwards to very marked hyperæmia of the kidneys. The existence of a very marked hyperæmia of the kidneys in cases of acute intestinal obstruction is not simply a coincidence. I would be almost disposed to regard it as a frequent occurrence, and one that should be carefully looked for in all acute abdominal affections; and when indicated by prolonged suppression of urine, the question of the relief of tension should be carefully considered.

The question arises, What is the cause of the anuria in these cases (VI and VII)? Two explanations may be offered—the non-elimination of urine may be brought about either by a spastic stenosis of the ureter, or by spasm of the smaller renal arteries secondary to the lesions of the bowel or omentum.

Examples of reflex inhibition of the functions of the kidney



are numerous. For instance, I have seen complete suppression of urine following the passage of a catheter and succeeded by hæmaturia for some days. Then, again, we have cases of unilateral obstruction such as is produced by the presence of a calculus in one ureter cause complete anuria, which may last for a considerable time; again, in cases of transitory hydronephrosis from angular insertion of the ureter, or from movable kidney, when the obstruction on one side reaches a certain point, the kidney on the opposite side fails to act, even although the hydronephrosis continues to increase in size. These cases seem to be analogous to those described above, but in them all it is very difficult to assert whether the reflex inhibition of the function of the kidney is due to reflex spasm of the walls of the ureters or to contraction of the small renal arteries; but the circumstance that the anuria is in many instances followed by the excretion of albuminous and bloody urine indicates that in these cases, at least, there has been a serious disturbance of the renal circulation. In some instances, doubtless, the anuria may be the result of a general fall in the blood pressure as a consequence of shock, but the circumstance that the pulse was of good strength in Case VI, and the anuria was relieved by wet cupping, is against this argument. Probably the suppression of urine in Cases VI and VII is similar to decrease of secretion in cases of lead colic or that which precedes a paroxysm of eclampsia. In these conditions, however, the spasm of the renal arterioles is probably not so marked, as the attacks are not usually followed by hæmaturia or albuminuria. To cause complete suppression of urine the spasm of the arterioles must be very great, and must involve the majority of the smaller vessels. The extent and gravity of the disturbance of the circulation is clearly indicated by the abnormal constituents in the urine when the attack has passed.



*THE RELATIONSHIP OF MOVABLE KIDNEY TO  
RENAL COLIC ASSOCIATED WITH TRANSITORY  
HYDRONEPHROSIS AND INTERMITTENT ALBU-  
MINURIA. TREATMENT BY OPERATION.*

TRANSITORY HYDRONEPHROSIS is met with in cases where the ureter is occluded only occasionally. A clear distinction must be drawn between those cases where, as a rule, the pelvis is not distended, and those where a more persistent swelling becomes temporarily relieved by a sudden urinary discharge. With this limitation, it may be said that transitory or relapsing hydronephrosis is seldom observed. This may be due to the circumstance that in those cases the sac of the hydronephrosis is not often of sufficient size to be detected by the hand, and the symptoms, although acute, are of short duration, being soon relieved by evacuation. Sudden accumulation and rapid subsidence of the swelling is an important characteristic of transitory hydronephrosis, and while, on the affected side, the pelvis is still filling and becoming more and more tense, on the healthy side there may be complete inhibition of the function of the kidney. An explanation of this will be sought presently.

In movable kidney obstruction to the escape of urine through the ureter may happen in three ways—(1) The displacement of the kidney may consist of a rotation of the



organ on its short axis, so that the ureter is twisted round the vessels; (2) there may be a sudden bending of the ureter at any part of its course; or (3) angular insertion of the ureter into the bladder may obstruct the passage of urine.

Whereas most modern pathologists regard the angular insertion and the valvular closure of the ureter to be the cause of hydronephrosis in such cases, Simon, and a few Continental writers, on the other hand, hold the opinion that the collection of fluid within the renal pelvis is the cause of the alteration in the relationship of the kidney and its duct. The latter assume that, a temporary impediment having caused a hydronephrosis, the kidney becomes displaced, and at the same time the lower half of the distended renal pelvis compresses the first part of the ureter; or if the pelvis be dilated more on one side of the point of origin of the duct than the other, the ureter is contorted, and a valvular obstruction created, which becomes permanent. As the accumulation increases the kidney becomes pushed outwards and backwards, while the upper portion of the ureter comes to be situated anteriorly. Another explanation has been offered by Landau, who holds that the frequently repeated displacements, twistings, and kinkings of the ureter in movable kidney are calculated to produce urinary obstruction and hydronephrosis. He maintains that "this view is confirmed by the fact that the majority of hydronephroses of obscure origin are seen in women of considerable age, and on the right side."

Transitory hydronephrosis may be characterised by severe renal colic associated with intermittent albuminuria, or with the presence of tube-casts in the urine, as will be shown in the following cases:—



CASE VIII.—*Movable Kidney—Transitory Hydronephrosis—Suppression—No Tube-casts, but Intermittent Albuminuria—Cure by Operation.*

M. H., æt. 35, a housemaid, enjoyed good health until January, 1889, when she commenced to complain of vague pains, as she thought, in the region of the stomach, but these were not so severe as to interfere with her regular

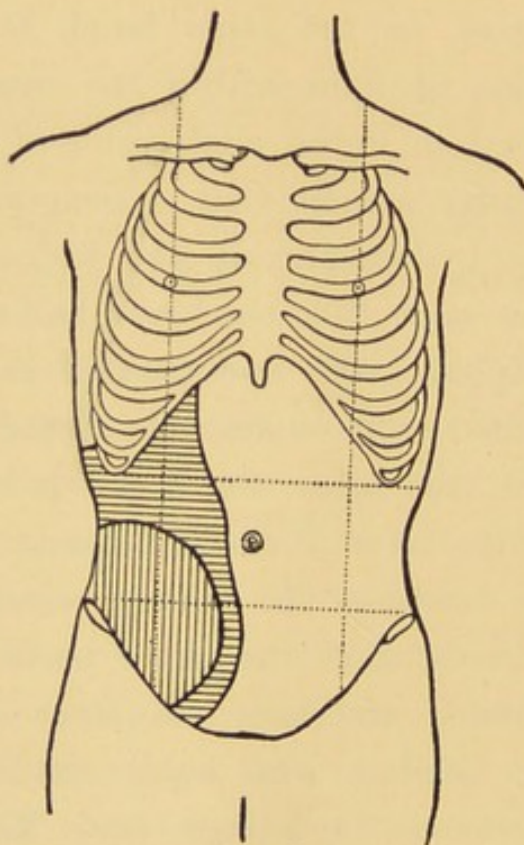


FIG. 1.

CASE VIII.—M. H., æt. 35.

The space occupied by perpendicular lining indicates the position of the hydronephrosis when fully distended; that occupied by the horizontal lining shows the space within which the kidney could be palpated.

occupation. She, however, gradually became thin and anæmic; steadily the pain increased, and after a time it became complicated by dyspeptic symptoms, such as nausea, severe attacks of vomiting, diarrhoea, and occasional constipation.

When I saw her first in November, 1891, she had developed all the characteristic symptoms of movable kidney on the right side, and on palpation the right kidney could be easily



made out. The radius of movement of the kidney is indicated in the diagram (Fig. 1), also the space occupied by the hydronephrosis. The most interesting feature of the case, however, was the occurrence of a transitory hydronephrosis. At first occasionally, but afterwards more frequently, she had more or less sudden attacks of severe pain associated with sudden diminution in the urinary excretion, sometimes amounting to total suppression. This apparent suppression was coincident with a rapid increase in size of the movable tumour within the abdomen, and also with severe paroxysms of pain, which lasted until the swelling was suddenly relieved by the escape of a large quantity of watery and slightly albuminous urine. At all times she suffered from more or less dull aching pain in the loins, extending at times over the whole abdomen, and sometimes down as far as the right knee. This pain differed entirely from what was experienced during an attack. The paroxysmal pain did not last more than six or eight hours, and while it lasted the patient was unable to lie in bed, but nearly always occupied a sitting posture, at first almost erect, but when the hydronephrosis attained a large size she would bend the chest forwards over the abdomen and elevate the knee so as to relieve pressure.

The symptoms just mentioned were accompanied by sickness, nausea, and vomiting. The following is a note of the examination of the urine before, during, and after one of these attacks:—

1889.	Quantity.	Sp. Gr.	REMARKS.
May 7, 8 A.M.	5 oz.	1016	Acid ; no albumen.
„ 12 noon.	16 „	1014	Do. do.
„ 4 P.M.	6 „	1026	Severe pain ; trace of albumen till 8 P.M. on the 8th May.
May 8, 8 P.M.	36 „	1008	Pain gone ; trace of albumen.
„ 9 P.M.	4 „	1012	No pain ; no albumen.
„ 11 P.M.	6 „	1014	Do. do.
May 9, 1 A.M.	5 „	1012	Do. do.



At 4 P.M. on the 7th May, 6 oz. of urine of high specific gravity was passed, and almost immediately following the paroxysm of pain set in, and continued with increasing severity for twenty-eight hours, when it was suddenly relieved after the passage of 36 oz. of urine of low specific gravity.

CASE IX.—*Right Movable Kidney, with Transitory Hydronephrosis from Kinking of the Ureter, Cured by the Operation of Nephrorrhaphy.*

C. G., æt. 34, single, was admitted into the Glasgow Royal Infirmary on the 1st November, 1895, complaining of a dull aching pain in the right loin, which commenced five years ago, and from then till now has steadily increased both in frequency and in severity. This pain was described as being almost constantly present; but over and above it she suffers frequently from paroxysmal attacks of severe colicky pain, which sometimes assumes a very acute character.

During the acute attacks the patient was herself able to feel a distinct swelling in the lumbar region, which on pressure was very tender. These acute paroxysms of pain occurred only at intervals of several months at the onset of the disease, but as time passed they have become more frequent. At the present time they recur nearly every second day. The onset of the pain was gradual, but the relief was sudden. Her own description of the attack was as follows:—

“Suppose the pain begins to increase about 1 o'clock in the day, it steadily becomes more severe until about night (6 or 7 o'clock); at the same time the swelling in the loin gradually enlarges, and sometimes extends beyond the middle line in front; as the swelling increases so also does the pain.” During the period of enlargement the urine was scanty and highly coloured, and of high specific gravity. Suddenly a copious



flow of pale-coloured urine took place, the swelling subsided, and the pain was suddenly relieved.

While the hydronephrosis was increasing the patient was generally compelled to go to bed; but very soon she was unable to lie in the recumbent posture, and required to sit up with the thighs flexed on the abdomen, and the chest thrown well forward in order to relieve pressure.

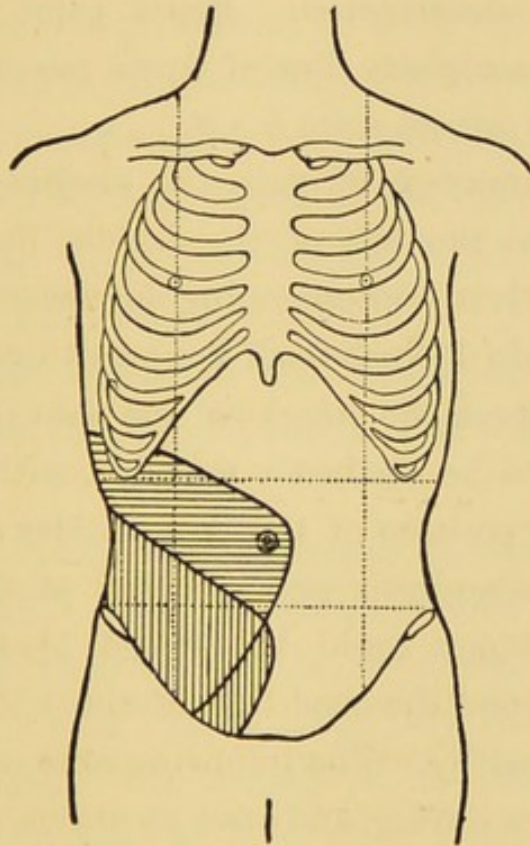


FIG. 2.

CASE IX.—C. G., æt. 34.

The radius of movement of the right kidney is shown in the diagram by the horizontal lining, and the space occupied by the transitory hydronephrosis by the perpendicular lining.

On examination of the abdomen between the attacks, the walls were observed to be very flaccid. When the patient lay upon her back a distinct bulging was observed in the lumbar region on the right side, which on palpation was found to be quite soft, but on firm pressure pain was elicited over a considerable area, extending from the crest of the ilium to the ribs, and as far forward as the middle line. The amount



of swelling varied greatly from time to time. When she was suffering from an attack of pain the swelling always increased, and the pain was relieved by a copious flow of pale urine.

Since admission to the hospital the worst attack occurred on the 12th November. The paroxysms of pain began at 5 A.M., and continued until 10 P.M. Towards the end of that period the patient suffered agony of pain, so that morphine required to be administered. Relief came about 10 P.M., accompanied by a copious flow of urine measuring 1,000 c.c., the first quantity passed since 6 A.M.

During the paroxysm of pain the swelling could be felt about 2 inches to the left of the middle line, between the umbilicus and pelvis, and extending downwards in the right iliac fossa to within  $1\frac{1}{2}$  inch from Poupart's ligament. During the intervals between the attacks of the pain the right kidney could be found to be distinctly movable, with the excursion ranging from the position of the gall-bladder above to within 4 inches of the symphysis pubis below; at the level of the umbilicus the kidney could be pushed  $1\frac{1}{2}$  inch across the middle line. Beyond the condition of the kidney the patient was absolutely healthy. The following note of the characters of the urine before, during, and after an attack is of interest:—

Date.	Quantity in oz.	Sp. gr.			
1895.					
Nov. 13, 3 P.M.	13	1016	Acid.	No albumen.	
" " 9 P.M.	11	1014	Do.	Do.	Pain set in.
" 14, 11 P.M.	40	1007	Do.	Do.	Pain relieved.
" 15, 6 A.M.	6	1010	Do.	Do.	Do.
" " 2 P.M.	13	1016	Do.	Do.	Do.
" " 9 P.M.	7	1016	Do.	Do.	Do.

At midnight on the 13th November pain was very severe, and continued so till 11 P.M. the following day, when 40 oz. of urine of low specific gravity were passed.



This case was clearly one of transitory or intermittent hydronephrosis, due to torsion of the ureter when the right kidney became displaced. The course of events noticed was sudden suppression of urine, almost immediately followed by paroxysms of severe pain, which continued and increased in severity until suddenly relieved by the copious flow of dilute urine.

Nephrorrhaphy was performed on the 26th November, 1895, and since that date there has been no recurrence of the pain, nor has any accumulation of urine been observed in the pelvis of the kidney. The main point in the operation was to fix the kidney as high up as possible, and firmly, so as to stretch out the tortuous and elongated ureter.

In this case the operation was completely successful, and the patient is now (December, 1896) quite well.

*CASE X.—Right Movable Kidney causing Torsion of the Ureter and Renal Vein, and leading to Hydronephrosis, Albuminuria, and the presence of Tube-casts—Operation—Cure.*

The patient, Miss A., came under my observation at the beginning of 1895. The history of the case, the physical signs, and the symptoms all pointed to right movable kidney of some years' duration. The patient was anæmic and emaciated, and it was considered desirable before an operation was performed to try the effect of complete rest in bed. This treatment by rest and by careful dieting was adopted during January, February, and March, but with comparatively little success, and it was resolved to perform nephrorrhaphy early in May. Frequent examinations of the urine were made during the first three months of the year, and on all occasions it appeared to be strictly normal. The day previous to the one on which the operation was arranged for a careful



examination was made of the kidney, when it was found to be swollen and unusually tender; and when the urine was examined it was discovered for the first time to contain a considerable amount of albumen, and some hyaline and finely granular tube-casts; but these were not found in the deposit, but only when separated by a centrifugal machine. On account of the albuminuria and the presence of tube-casts in the urine the operation was postponed, and on the 3rd of May

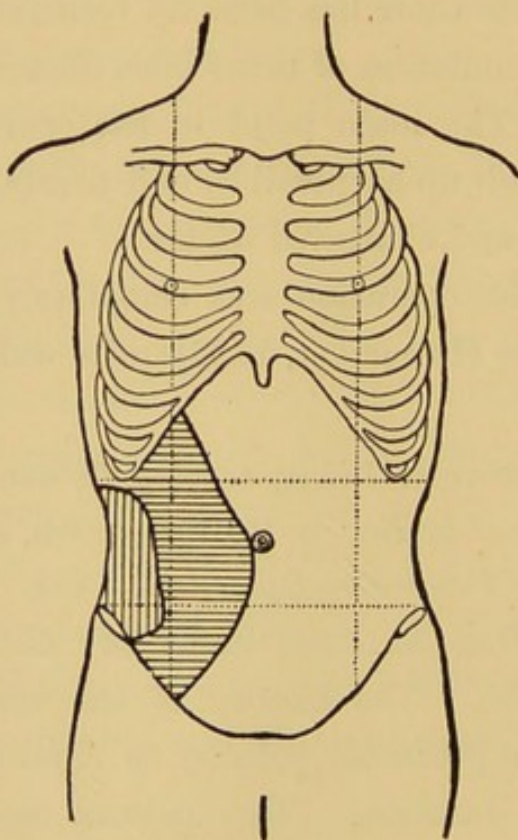


FIG. 3.

CASE X.—M. A.

Lining same as Case VIII.

all the samples of urine were carefully examined as shown in the following table. At first the possibility of a nephritis being present was considered, but as no symptoms beyond the albuminuria and the presence of the tube-casts could be discovered, I carefully watched the course of the urine to see if any other explanation of the albuminuria could be



discovered. Every sample passed was kept for the examination, with the following results:—

1895.	Quantity.	Sp. gr.	REMARKS.
Apr. 29, 9 A.M.,	9 oz.	1023	Acid; considerable albumen and tube-casts; pain in kidney severe.
Apr. 30, 8 A.M.,	7 „	1023	Do. do.
„ 12 Noon,	10 „	1019	Acid; trace of albumen; pain much less; tube-casts.
„ 4 P.M.,	13 „	1010	Do. do.
„ 9 P.M.,	6 „	1015	Acid; no albumen; no tube-casts.
May 1, 2 A.M.,	17 „	1009	Do. do.
„ 7 A.M.,	13 „	1009	Do. do.
„ 1 P.M.,	10 „	1013	Do. do.
„ 9 P.M.,	7 „	1014	Do. do.
May 2, 6 A.M.,	10 „	1010	Do. do.

With the onset of the attack of paroxysmal pain, sometimes there was present hydronephrosis, sometimes it was absent or not observable; but high specific gravity of the urine, albuminuria, and tube-casts always appeared in the urine at such times, and disappeared at the same time as the pain. Since the operation was performed no albumen or tube-casts have been found.

CASE XI.—*Left Movable Kidney causing Torsion of the Renal Blood-vessels—Albuminuria, Tube-casts, Severe Pain, and Suppression of Urine—No Hydronephrosis—Operation—Cure.*

J. D., æt. 41, married, and has a family of nine children. She was at one time very stout, but during the last three years had been steadily emaciating. She first complained of pain in the left kidney in 1887, and when I saw her first in 1894 she was greatly reduced in weight. The abdominal walls were flaccid, and she complained of almost continual pain located in the left lumbar region. At irregular intervals most severe paroxysms of pain set it, and these lasted from three to seven hours, and were accompanied by sickness,



nausea, and vomiting. During an attack the patient always lay upon her left side. In one or two instances, after the paroxysms had passed off, the patient suffered from undue excitability, severe and persistent headaches, and dimness of vision, pointing probably to some uræmic poisoning. On examination of the abdomen the left kidney could be

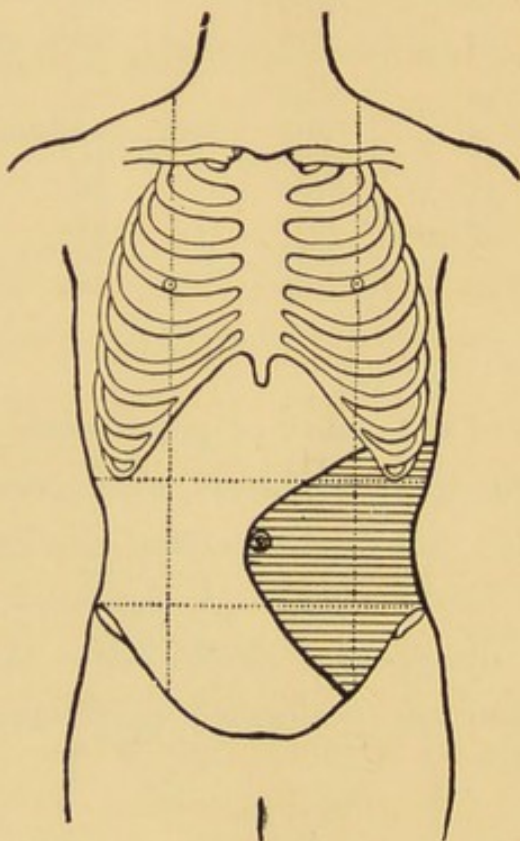


FIG. 4.

CASE XI.—J. D., æt. 41.

Lining indicates the space in which the kidney moved.

distinctly felt freely movable within the abdomen, and could be pushed upwards under the left costal cartilages, across the middle line in front, and down into the pelvis. Handling of the kidney produced considerable pain accompanied by sickness. This pain differed in character from that usually felt during a paroxysm. The following is a note of the urine passed during one of the paroxysmal attacks:—



1894.	Quantity.	Sp. gr.	REMARKS.
Feb. 11, 2 P.M.,	15 oz.	1013	No albumen ; no tube-casts.
„ 11 P.M.,	17 „	1012	Do. do.
Feb. 12, 9 A.M.,	18 „	1018	Do. do.
„ 8 P.M.,	10 „	1020	Moderate quantity of albumen and a few tube-casts ; pain set in at 6 P.M. on the 12th, and continued till midday on the 15th.
Feb. 14, 7 A.M.,	13 „	1023	Do. do.
Feb. 15, 2 A.M.,	11 „	1022	Do. do.
„ 9 A.M.,	16 „	1012	Trace of albumen.
„ 8 P.M.,	15 „	1010	No albumen.

The patient was kept under observation for many months, and although advised to have an operation performed, refused until November, 1895, when, with the assistance of Dr. E. A. Gibson, I performed nephrorrhaphy. The result was quite satisfactory. Patient reported herself well, January, 1897.

In the first two cases there was little or no difficulty in understanding the condition. The increase in size of the movable tumour at the time the symptoms arose, and the disappearance of the hydronephrosis before they were relieved, indicated very clearly that the attacks were due to obstruction to the flow of urine through the ureter. The character of the urine, and the position which the patient assumed in bed, aided us in forming a diagnosis. In cases of hydronephrosis from torsion of the ureter in movable kidney the patient is unable to lie down in bed, but almost always sits up, with the knees flexed on the abdomen and the thorax thrown forwards. In transitory hydronephrosis the quantity of urine is suddenly diminished in amount, as illustrated in Cases VIII and IX, and previous to the paroxysm of pain being relieved a large flow of dilute urine is observed to escape. On the other hand, in cases of torsion of the renal vessels, as in Cases X and XI, the paroxysmal attack is associated



with a sudden and transitory albuminuria, sometimes without suppression of urine, and no increase in the size of the renal swelling. In Case XI, from 8 P.M. on the 12th of February till 2 A.M. on the 15th, only 34 oz. of urine was passed, but of high specific gravity and containing albumen and tube-casts. In all four cases nephrorrhaphy was performed with a good result.

These cases also raise several points of considerable pathological interest.

When the efflux of urine from the kidney is suddenly impeded, we know, from the experiments of Herrmann and those performed by myself, that the quantity of urine excreted in a given time is diminished, and that there is also a reduction in the percentage of solids in the urine. When the backward fluid pressure reaches a certain point the excretion ceases, and this at a point when the pressure on the fluid contained in the ureter is considerably below the arterial pressure. But as soon as the obstruction is relieved, the kidney regains its function, and an abundant secretion of urine of low specific gravity rapidly follows. Fortunately when the escape of urine is impeded by occlusion of the ureter, the velocity of the blood stream is reduced, owing to the pressure exerted by the over-distended uriniferous tubules upon the capillaries and blood-vessels. The urine in the kidney is probably also reabsorbed to some extent, just as in obstruction of the gall-ducts the bile is taken up by the circulation. This is demonstrated by the œdematous condition of the kidney after ligature of the ureters, an œdema which rapidly disappears on the ligature being relieved. The rapid excretion of a large quantity of watery urine after relief of the ligature of the ureter is probably accounted for by the evacuation of the œdematous fluid, and by an active arterial hyperæmia which follows the relief of pressure on the capillaries.



In cases of transitory hydronephrosis, while the pelvis of one kidney is becoming distended the action of the opposite organ is suddenly inhibited as shown by complete suppression. This circumstance has already been referred to under torsion of the renal vessels (p. 25). Many cases have been recorded where a unilateral obstruction has produced a complete anuria, lasting sometimes for days. But it is difficult to say whether suppression on the unobstructed side is due to a spasm of the muscular fibres of the ureter, or to a local reduction of blood pressure from spasm of the arterioles. The circumstance that pain is not a prominent symptom, except on the hydronephrosed side, would point to the latter rather than the former as the cause of anuria.

Take, for example, Case VIII. At 4 P.M. on the 7th of May the patient had a sudden attack of renal colic, which continued with increasing severity for twenty-eight hours. During that time, while the pelvis of the right kidney was being distended with urine, the left kidney failed to secrete, as on passing a catheter into the bladder no urine escaped.

This is a remarkable fact, as one should have expected a compensatory functional activity of the healthy organ rather than a complete suppression of function. The same conditions were observed in Case IX.



