THE LETTSOMIAN LECTURES

ON THE

AFFECTIONS OF THE URINARY APPARATUS IN CHILDREN.

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LECTURE I.

CONGENITAL ABNORMALITIES.

LIKE other organs of the body, the kidneys are not exempt from certain eccentricities of development, but as the majority of instances have been found in the bodies of adult persons who have died from causes unconnected with such conditions, it is seldom that these abnormalities have to be reckoned with in early life.¹ A recognised variation from the normal is found when the two organs are united, either by renal tissue or by a fibrous band, constituting the horseshoe kidney. Its convexity always faces downwards, and it lies transversely over the lumbar spine, generally rather lower than the level of the normally-placed gland. There are usually two ureters which pass in front, but sometimes behind the organ, and the vascular supply is also double. Of this condition there are occasional variations, but so far as regards our present subject, the horseshoe kidney is of interest only as an abnormality, since I have not met with an instance where, in the case of child, it has been in itself the source of disease or of difficulty in the diagnosis of other affections.²

The kidney may retain more or less its lobulated foetal form into adult life without any impairment of efficiency. The absence of one kidney and a corresponding hypertrophy of the other is a possibility that may have to be reckoned with. The left is by far the most frequently found to be defective.³

When the kidney is absent, the corresponding suprarenal capsule is also wanting in one out of every ten. In Morris's work, and in the volumes of the Pathological Society's *Transactions*, will be found many instances of abnormal position of a single kidney; but although the possibility of such an occurrence may be borne in mind in the diagnosis of obscure tumours, they are exceedingly rarely met with, and need only be suspected when there also exists some other congenital malformation. Roberts states that in 21 cases of congenital malposition of the kidney which he had been able to collect and to compare, the abnormality was in every instance confined to one kidney, and the left was much more commonly affected than the right (left 15, right 6). The most frequent of these deviations was to find the kidney lying obliquely on the sacro-iliac synchondrosis. In some of the cases the organ was fixed beside the uterus, or transversely between the rectum and bladder, or across the prominence of the sacrum. Such abnormalities have led to mistakes in diagnosis and even of treatment in the case of adults, and in women to trouble in parturition. Only two instances are to be found in our tables, and in children it is so easily possible when the muscles are relaxed by an anæsthetic, to examine the abdomen, that the absence of a kidney from its normal position or its presence in an unusual one would hardly fail of detection if once suggested. It is of the greatest importance in considering this question that the condition of the organs of generation should be carefully examined, since they frequently exhibit concomitant variations where the kidneys are abnormal.

Although instances of complication from this condition are very rare, it is one that it is important to bear in mind when dealing with cases of sudden and complete suppression of urine, since in such cases it is possible that one kidney is congenitally absent and the remaining ureter obstructed. Especially is it important, both in adults and in children, when the question of nephrectomy has to be entertained that all indications of the absence or atrophy of one kidney should be carefully regarded. Although some cases of movable kidney have been reported as occurring in children where

the gland is suspended in a peritoneal fold of its own, the mesonephron, and where the vessels are of undue length, the condition so rarely gives rise to symptoms as to require no discussion.

CONGENITAL HYDRONEPHROSIS.

The ureters show frequent aberrations from the normal type. Dr. Ewart has described a case where each organ had two separate ureters, which began in distinct pelvises and terminated independently in the bladder. All four were pervious. Sometimes two ureters leaving the pelvis of the kidney unite before entering the bladder at the usual situation. In 5 instances of double ureter noted in the books of Great Ormond Street, 4 were on the right side and 1 on the left. In no case were they the source of disease. It is with regard to their causative relations to congenital hydronephrosis that the abnormalities of the ureters are of special interest. In 20 out of 52 cases of hydronephrosis Roberts found a congenital malformation. Among the necropsies at the Hospital for Sick Children there were 12 cases of dilated pelvises or hydronephrosis; 2 of these were complicated by imperforate anus and 1 by harelip, another by cleft palate. In several of the London museums are specimens of hydronephrosis in young persons due to phimosis, and Mr. Morris and Dr. Alexander James have both pointed out that dilatation of the ureters and pelvises may be the result of increased frequency of micturition, which, by exciting frequent contraction of the walls of the bladder and frequent closure of the vesical orifices of the ureters, owing to the anatomical arrangement whereby the ureters traverse the parietes of the bladder, thus occasion frequent resistance to the outflow of urine from the ureters. The same explanation may account for the dilated and tortuous condition of the ureters, which is generally found to exist in cases of ectopia vesicæ, when, as can be seen, the discharge from the orifices of the ducts is constant.

Newman describes a specimen from the body of a stillborn child in which a cyst about the size of a walnut completely occluded the right ureter and caused enormous distension of the renal pelvis, and a similar case occurred at Great Ormond Street, where both kidneys and ureters, which were double on the right side, were dilated in consequence of a small cyst which was found in the bladder, and a few specimens are recorded as resulting from an imperforate urethra. Sutton has recently described four cases of congenital hydronephrosis, in two of which the dilatation of the pelvis was due to the minuteness of the opening of an inadequate ureter; in a third, which was obtained from an infant, the right kidney only was present, the infundibula, pelvis, and ureter were widely dilated, and at the point where the ureter opened into the bladder there was a small circular diaphragm-like valve which, though offering no obstruction to the flow of fluid from the ureter into the bladder after death, probably acted as a mechanical obstacle during life.

These being the main congenital causes of hydronephrosis, it is important to notice the frequency with which both kidneys are affected. Out of 20 cases collected by Roberts, in 13 the condition was bilateral, a statement which must be borne in mind in considering the question of nephrectomy. Two of these perished stillborn, 1 lived six hours, 1 thirty, and 1 forty-six hours, while 1 died twenty days and another between three and four months after birth. In other cases where life was prolonged "we must assume," says Sir W. Roberts, "that the impediment to the urinary flow was at first incomplete, though the malformation was congenital, and that its effects were not fully developed until a subsequent period, and then probably with extreme slowness."

It is unnecessary to describe here the well known appearance of kidneys affected by this condition. Generally they present a mere fibrous skeleton of the gland with the pelvis and calices enormously dilated, and the secreting structure to a great extent and sometimes entirely absorbed. The surface shows numerous rounded elevations bounded by fibrous septa, and corresponding to the lobules of which the foetal kidney is composed. The fluid which is contained in such a sac is of a low specific gravity, and contains little urea or uric acid.

As already indicated in the foregoing enumeration of causes, the effects may be immediate or remote. If the condition affects both kidneys, death usually occurs at a very early period. If, on the other hand, it be unilateral and due

to permanent obstruction of the ureter, there may be no symptoms, and life may be prolonged to its natural term. When, however, the cause is intermittent, as in many instances that have been given, a tumour is produced which requires to be differentiated from other similar swellings. In the absence of any history of severe crush or blow, it will not be confused with a perirenal hematoma or perinephritic abscess. Notably it may need to be distinguished from ascites, especially if both kidneys are involved, which can, however, hardly ever be the case; and where the one kidney only is affected, the permanent dullness on the affected side in all positions, and the uneven surface of the tumour, will probably make the distinction an easy matter. From the rare cases of ovarian cysts in children, the tumour would be distinguishable by the presence of colon in front of the tumour and by the dullness in the lumbar region of the side affected. Hydatids of the kidney are very rare in children, and their presence could only be surmised by the detection of the hydatid fremitus and by the passage of cysts with the urine. The presence of pus in the urine and the accompanying pyrexia would indicate the condition of pyonephrosis, whether engrafted upon the cystic condition or arising in consequence of a calculus in any part of the tract, or due to tuberculous disease. The region of the kidney is occasionally the site of tumours of the character of cystic hygroma, and other congenital cysts are found to occur in the neighbourhood. Such are the various forms of mesenteric cysts described by Mr. Treves in his work on surgery, and others related by Mr. Moynihan.⁴

Two interesting cases in which the cysts were removed have recently been related by Mr. Eve in a paper at the Royal Medical and Chirurgical Society. In congenital hydronephrosis there is one sign which only occasionally is given, but which is definitely reliable as indicating the nature of these tumours, namely, the sudden subsidence of the swelling, followed by an increase in the flow of urine.

If the dilatation becomes sufficient to form a tumour, which it may do at any time between the third and eleventh year, or even later, the necessity for surgical interference will arise, partly as a means of diagnosing the exact nature of the swelling, and partly to relieve the patient of the inconvenience, and sometimes even of the pain and the effects of pressure upon the intestines which occasionally result. A trial may first be made of systematic rubbing, which was successful in the case of a girl, aged 8 years, under Sir William Roberts, who suddenly passed a large quantity of urine, when the swelling subsided and did not return. The same treatment was temporarily successful in a child of three months under Sir W. Broadbent, and in a third case under Mr. Thurnam, in a boy aged 4 months. But where this treatment is not available either on account of the pain caused or the risk of rupturing the cyst, the fluid must be withdrawn by the aspirator or trocar. In the absence of any very distinctly fluctuating area Morris directs that in the case of the left kidney the puncture should be made just anterior to the last intercostal space; whilst on the right side, to avoid all risk of injuring the liver, it should be half way between the last rib and the crest of the ilium, between 2 inches and 2½ inches behind the anterior superior spine of the ilium. The fluid thus released often amounts to a very large quantity, and is of a brownish colour, and contains urates and urea. As a rule it accumulates very rapidly, and fresh tapplings are required. Although this proceeding is occasionally successful, and the insertion and retention of a drainage tube has been followed by temporary relief, the operation that is most satisfactory is nephrotomy, followed by tapping of the cyst, and attachment of the margins of the incision in the tumour to the edges of the wound in the loin. Through the india-rubber drainage tube which is inserted all discharges can readily pass, and can be caught in a suitable appliance. Newman quotes four cases in children under 12 years of age, all of which were successful. In three the lumbar incision was used, and in one the cyst was reached from the abdominal surface.

Should the sac suppurate, and the discharge become a source of exhaustion, and should there be evidence that the renal tissue is incapable of performing its function, lumbar nephrectomy may be called for. Newman's tables give 8 cases in children under 12 years of age, where the kidney was removed for hydronephrosis, 6 recovered and 2 died. In 4

the abdominal incision and in 4 the lumbar was resorted to, one death occurring to each. To these may be added a case of a girl, aged 13, from whom a large hydronephrotic kidney was successfully removed by my colleague, Mr. Owen.⁵ The possibility of involvement of the opposite kidney must always be borne in mind in operating upon these cases.

Only recently a child who had for some months been in the medical wards of the Hospital for Sick Children suffering from symptoms of intestinal obstruction was transferred to the surgeons on account of a tumour which developed on the right side of the abdomen. The urine had for some time been purulent. The child was aged 4, and was otherwise well formed. Mr. Pitts opened the abdomen by Langenbuch's incision, and felt what he took to be a healthy kidney on the left side. The tumour, which proved to be an intensely dilated kidney with most of the secreting structure destroyed, was then removed. No urine was subsequently passed, and the child died at the end of three days. At the necropsy it was found that the left kidney was almost non-existent, and quite incapable of function. A ureter of the natural size and patent opened into the bladder at the normal site, and the suprarenal capsule was normal in size and position. The right ureter was greatly dilated, and its orifice was exceedingly small.

CONGENITAL CYSTIC KIDNEY.

In the Hunterian and a few other London museums are to be found specimens of kidneys taken from fetuses or newly born children where the whole gland is converted into a congeries of cysts. Quite recently Dr. Still has described a specimen which was removed from the body of a girl, aged 8 weeks. It was born prematurely at the eighth month. Both kidneys were affected, and on section had a honeycomb appearance due to numerous small, more or less tubular, cavities separated from one another only by fine septa; these cavities seemed to be more developed in the cortex than in the pyramids. The pelves and ureters were normal. The liver in this case, as in many others that have been described, also showed on section numerous small cavities. This condition is bilateral, and is ascribed by Virchow to intrauterine nephritis, or to impaction of the straight tubules with uric acid, both of which lead to atrophy of the papillæ and obliteration of the pelvis of the kidney. Koster considers it to be due to a malformation of the lower urinary tract. Shattock, regarding this condition from the developmental point of view, argues that it results from a want of differentiation of the metanephric blastema, out of which the permanent kidney is developed, from that of the mesonephron or Wolffian body. The proper tissue of the kidney grows into that of the Wolffian body, while the remnants of the latter become the seats of the cysts scattered through the proper renal tissue. The enlargement of these cysts may, by irritative tension upon the intertubular tissue, produce an excess of this tissue, and cause the origin of the urinary retention cysts, and the presence of these cysts would certainly produce secondary pressure on the proper renal tubules and thus lead to the formation of true renal retention cysts. Dr. Still, whose interesting paper will be found in the next volume of the *Transactions of the Pathological Society*, adopts this view, and, putting aside the theory of intrauterine inflammation, believes that the same cystic condition which is found in adults of 50 to 70 years of age is due to the presence of glomeruli and tubules which for a long period retain a healthy condition.

INJURIES OF THE KIDNEYS.

Children, and particularly boys, are liable to injuries from crushes or from the passage of wheels over the abdomen which produce lesions of the kidney or ureter, or the tissues which envelop them. In the latter case there may be nothing but a circumscribed collection of effused blood which may be absorbed or may become surrounded by lymph in which it is encapsuled, and from changes of the constituents a cyst is formed which is variously styled perirenal or paranephric. Or again, the effusion may break down, and forming an abscess, give rise to all the constitutional effects of suppuration, and ultimately point in the ilio-costal region. But this perirenal extravasation is often followed at a period of from two weeks to two months by a swelling containing more or less clear fluid with some of the constituents of the urine. These have been shown by Barker to vary inversely to the amount of pressure within the sac which forms around the extravasation. These effusions are liable to suppurate or to rupture into the peritoneum.

From a consideration of the more important of several recorded cases the course and symptoms of this accident can

be gathered. After the first symptoms of shock, followed generally by vomiting, there is more or less hæmaturia lasting for two or three days. If the ureter becomes blocked with clots there is considerable pain which is referred to the loins and runs down to the testes. These symptoms may be induced by a simple bruise of the kidney, but if there be rupture of the ureter or pelvis, or laceration of the gland structure, in the course of time a tumour will appear which may attain a very large size, and form what has been termed a spurious hydronephrosis.

Unless it becomes necessary to cut down upon the kidney, or to remove it, the actual lesion can only be guessed. The ureter may be blocked with clots, which when passed will allow the passage of urine, and the patient shows no further sign of the injury. Or the amount of blood may be such as to excite an acute cystitis, as in the case that is described by Dr. Rawdon, of a boy aged 12 who injured the right kidney by a fall. The hæmaturia was followed by cystitis, and to avoid further hæmorrhage the kidney was removed by a lumbar incision, and was found to be torn completely across. Four days later lateral cystotomy was performed, and a free drain established. The patient died on the fortieth day from pyelitis and circumscribed suppuration of the left kidney.

The treatment of these injuries, therefore, is in the first instance to check further hæmorrhage and to subdue pain; then to watch carefully for any changes indicating suppuration in the effusion or the formation of swelling by the secretion of the kidney. Aspiration may be tried and supplemented by gentle massage, but if the swelling increase, or if there be any signs of suppuration a lumbar incision must be made and the state of the kidney investigated. If this be ruptured it must be removed, but if not, a drainage tube must be inserted and the cavity washed out with antiseptic solution until it closes.

In removal of the kidney under these circumstances the surgeon may count upon the healthy state of the opposite organ, unless there is reason to fear that it also has been damaged by the accident, although one case is recorded where rupture took place of a single hypertrophied kidney.

PERINEPHRITIS.

Apart from traumatic causes perinephritis and perirenal abscess are very rare in children. The *post-mortem* books of the Hospital for Sick Children record very few instances, and the majority of these are due to pyæmia. Calculus in the kidney, though producing pyelitis, seldom gives rise to inflammation in the surrounding tissue. Dr. Gibney reports 23 cases of primary perinephritis in children, the majority occurring between the ages of 3 and 6 years. Most of the cases had been diagnosed as disease of the hip-joint or of the spine. Resolution followed in 12, and 16 ended in suppuration. Personally I have met with few.

One case that was sent to me was that of a young gentleman aged 8 who presented many of the features of hip-joint disease. A large abscess soon presented itself in the iliac region which was not due to spinal caries, and was not apparently perityphlitic. There was a history of a kick upon the loin some time previously. A large abscess was opened and drained through the lumbar region. All the hip symptoms passed away, and he is now strong and healthy. Exploration showed the abscess to surround the kidney.

THE SIGNIFICANCE OF HÆMATURIA.

Before passing to other diseases of the kidney, it may be well to review the causes of the presence of blood in the urine. Hæmaturia may indicate a local or a general disease, and the detection of its origin must always be of primary importance. It may arise from any part of the track, and may be so minute as to escape all but the most careful search by the microscope or by tests. It may be constant and slight or profuse and intermittent. Apart from poisoning by such drugs as chlorate of potash, cantharides, turpentine, carbolic acid and rhubarb, small quantities of blood are found in the urine of young infants as the result of irritation of the tissue of the kidney by uric acid and other crystals; when more abundant it occurs in connection with the other evidences of scurvy rickets, of which it is sometimes the earliest symptom. In purpura, the hæmorrhage from the kidney is often profuse with intervals of intermittence, and in hæmophilia it is also common.

Dr. J. Abercrombie has recorded a case of Raynaud's disease in which a little boy passed bloody urine day after day for six weeks together in the colder seasons, which ceased

when the child was kept warm before the fire. In vol. xv of the *Transactions* of this Society will be found a very interesting account of a case of Raynaud's disease with paroxysmal hæmoglobinuria by Dr. Haig, in which he says that his previous researches led him to believe that both the Raynaud's disease and the hæmoglobinuria in this case (that of a girl, aged 6 years) were due to excess of uric acid in the blood (uricæmæmia), and this theory affords a most simple explanation of their evident connection. Blood in smaller quantities occurs in Bright's disease, in hæmorrhagic measles, in scarlatina, diphtheria, and small-pox. What has been named Winckel's disease, in which cyanosis, jaundice, and hæmoglobinuria attacks newborn children on or about the fourth day and causes death in forty-eight hours, has not been observed in this country; but paroxysmal hæmaturia or hæmoglobinuria, where no blood corpuscles can be detected but the urine is nevertheless stained with blood pigment, has been fairly often detected. Herringham has described the cases of two sisters, $3\frac{1}{2}$ and $4\frac{1}{2}$ years of age, who were hereditarily syphilitic; and Dr. Voelcker, who has noted several others, finds a syphilitic taint in all of them. I have, however, seen a typical case in private where no such suspicion could have existed.

But it is as a symptom of local affections that hæmaturia is of diagnostic value to the surgeon, and of these I shall have to speak later. As a general rule, hæmorrhage from the kidney is more profuse than from the bladder, and is seldom accompanied by pain unless it gives rise to the formation of clots in the ureter, when the pain may be referred to the loin, the testes, or the thigh, but ceases as soon as the clot is washed onwards to the bladder. The origin of the hæmorrhage from the kidney is generally confirmed by the presence of casts and epithelium. In examining cases of supposed hæmaturia it is well to keep one's eyes open to the possibility of deception, as instanced by the case narrated in the *Clinical Society's Transactions*, vol. xxiv, by my late colleague, Mr. Leopold Hudson, of a boy, aged 11, who gave a history of suffering from the usual symptoms of stone, and brought a specimen of his water with a red stain, which was afterwards found to have been produced by steeping in his urine a piece of rag stained with Turkey-red dye.

TUBERCULOSIS.

The acute miliary form of tuberculosis which affects the kidney is only a local manifestation of a general disease, and is very commonly in children associated with tuberculous phthisis or meningitis. Dickinson found that in nearly a sixth of all children dying thus affected, tubercle was present in the kidneys, and states that renal tubercle is nearly three times more frequent under than over the age of 12. Of 28 children under 12, both kidneys were affected in 19, 1 only in 9, and the sexes were attacked impartially. Out of 24 children dying under the age of 12 with the kidneys involved, 13 died under 5 years of age, and 11 between the ages of 5 and 12 years. This corresponds with the estimate of Rilliet and Barthez, who found that in 315 tuberculous children tubercle of the kidney was present in 49, or 15 per cent., and that, therefore, the kidney was three times more liable to tuberculous deposits in children than in adults. The invasion of this organ is seldom marked by any distinct symptoms and the affection of the kidney is disguised by the more evident signs of disease which are manifested in the lungs or the brain. Such conditions, therefore, admit of no surgical treatment. When the disease originates in the urinary organs, the infection may be conveyed by three sources. The principal and commonest is by the blood. Secondly, it may ascend by the ureters or lymphatics from the bladder; or thirdly, it may extend from the surroundings of the gland. I shall have to speak of the second of these sources when dealing with tuberculosis of the bladder.

Chronic localised tuberculosis or strumous disease of the kidney is by no means frequent in children. Out of 15 cases collected by Morris, there was not one instance in a child younger than 11 years. The pathological history of the affection is the same as that of the disease in other organs. The bacilli conveyed in the blood stream to the glomeruli for elimination must of necessity cause great risk of infection, and consequently the principal seats of the early deposits are the apices of the papillæ, the calices, or the

pelvis of the gland. First are deposited the miliary nodules, and these coalesce to form caseous masses. As these break down fresh nodules are deposited in other parts, and the caseous necrosis that ensues lays bare an ulcerating surface in the pelvis, whilst in the periphery they form irregular cavities. As more and more renal substance becomes involved these cavities coalesce and the secreting structure may be entirely destroyed. Generally the pelvis of the kidney and the ureter become thickened, the mucous membrane ulcerates, and its lumen is occluded. If the ureter remains pervious, the *débris* may be washed away, and in its course will almost surely involve the parts below, and thence the disease may ascend to the opposite organ. If, however, the ureter become blocked, the whole organ may be converted into a large abscess cavity or series of cavities with caseous *débris*—tuberculous pyonephrosis. Sometimes the obliteration of the ureter causes the whole organ to be converted into a shrunken, putty-like mass, or large abscesses may result by the access of pyogenic organisms.

In view of the rarity of this affection in childhood it might seem hardly worth while to linger over its symptoms or its diagnostic difficulties, yet there has been a sufficient number of cases in which operation has been satisfactory to encourage the hope that a larger number of successes might follow an earlier recognition of the affection. This is, however, a matter of peculiar difficulty at all ages, and especially in young patients, since symptoms in the earlier stages are little marked and local signs are absent; whilst, on the other hand, when evidence is more pronounced—when the urine becomes constantly purulent and vesical irritation is a marked characteristic, the disease has so far involved other portions of the tract that only palliative treatment can relieve.

It becomes, then, of the utmost importance to examine closely all signs which may indicate an early invasion of the gland. The symptom, so common to many other affections—thamuria, or frequency of micturition—is here also that which directs attention to the possibility of some morbid condition in the kidney, and when all other causes can be eliminated, the region of the kidneys should be carefully palpated and the question of tenderness investigated, and any history of pain in the loin or in the testes examined. Any increase of size in either gland can best be appreciated with the aid of an anæsthetic. The urine offers few indications in the earlier stages except that its quantity is often increased, and the specific gravity is frequently low. At a later period it becomes purulent, and, as distinguished from calculous pyelitis where the amount of pus is intermittent, in scrofulous disease it is always continuous unless the ureter becomes blocked. Even with large quantities of pus the urine in the early stages is generally acid. Examination for the tubercle bacillus should never be omitted, and must be most carefully carried out, but no reliance can be placed upon its absence. I have frequently been disappointed in searching for it, even in marked cases of tuberculosis of the bladder and other parts of the tract. Blood is only to be found at intervals, and seldom in large amount. It is, especially in the earlier periods, a matter of the utmost difficulty to differentiate between the pyelitis of tubercle and that of calculus; but in the latter the inflammation of the pelvis does not spread to the ureter or bladder, and there is therefore no dysuria such as forms a very distressing symptom in the later stages of the former. Whenever, then, these early stages have been observed the constitutional symptoms must be carefully watched for—the evening pyrexia, the night sweats, pallor and emaciation which ordinarily accompany the invasion of tubercle in other parts. Even if catheterisation of the ureters were possible in the case of children the plan is not advisable for fear of spreading disease in the healthy ureter, and the use of the endoscope is prohibited except in a few cases, so that there is no aid from such sources for detecting whether pus comes from one or both ureters.

If, then, from such evidences there arise a strong suspicion that one kidney is affected by scrofulous disease, the question has to be decided whether surgical interference is justified. Speaking of the disease generally, Dickinson states that both kidneys are affected as often as one alone, and only one case in seven occurs in which the disease does not affect other organs. Aldibert has collected 12 cases of children in which

nephrectomy was performed. Of these 9 recovered and 4 died, two of the deaths not being traceable to the operation or to the original disease. No recurrence had taken place in one at the end of eight years, and none in another after three. Gross's tables give 20 instances of removal of the kidney at all ages for scrofulous disease; 12 recovered, 8 or 40 per cent. died. Tubercle was limited to one kidney in only 65 per cent. In 8 cases of preliminary nephrotomy relief was not afforded, so that this proceeding is not recommended.

Morris, on the contrary, recommends that nephrotomy should first be tried in cases that are not advanced, in the hope that it may check progress by opening and draining the abscess cavity. Nephrectomy may be performed later if strength improves or if lardaceous disease threatens. He adds: "It is in the scrofulous kidney especially that we so much need the means of ascertaining the working capacity of the other kidney, and it is in these cases also that the difficulty of doing so is almost insuperable."

Gross, from this point of view, recommends the operation in an early stage by means of a ventral incision, by which both kidneys can be examined, and of which he states the mortality to be 14.28 per cent. against 53.84 per cent. by lumbar method. Newman's tables, published in 1888, record 2 cases of nephrotomy for this condition in childhood, both of which ultimately recovered, though one (Morrant Baker's) subsequently had the kidney successfully removed, and 5 cases of nephrectomy, 4 of which recovered. To these may be added a case by Wright, in which at intervals nephrotomy, cystotomy, and nephrectomy were performed, the child dying with much ulceration of the bladder; and a case by Eve, where in a child aged 3 years and 9 months nephrotomy was first performed, and seventeen days later the kidney was removed through a prolonged incision. The child recovered and was in perfect health seven months later.

In the light of these results it would seem that where abscess is large nephrotomy and drainage should first be tried, and later nephrectomy; but where suspicion of an early state of disease is tolerably certain, the two kidneys should be examined by means of a ventral incision, and if one be found healthy and the other extensively diseased it should be at once removed.

REFERENCES.

¹ Englisch (*Wiener med. Zeitung*) states that a foetus may attain the age of 7 to 8 months with the kidneys wanting or rudimentary, the ureters obliterated, and bladder undeveloped. In some 40 cases he had found atresia of the urethra or absence or defects of the ureters, the foetus reaching 8 to 9 months; and Rayer and others have recorded the absence of kidneys in the foetus. But notwithstanding some cases which have been published, it may at once be said that the subjects of such deficiencies are not viable. ² The rarity of its occurrence may be judged by the figures of Morris, who found only 9 instances in 14,318 necropsies, or about 1 in every 1,600. From the records of the *post-mortem* books of the Hospital for Sick Children, extending over twenty years (1878 to 1897), which have been searched for this purpose by Mr. Templeton the surgical registrar, out of 2,594 necropsies only 3 instances of horseshoe kidney are noted. In 1 the left ureter was dilated, and 1 was complicated by imperforate anus. ³ Mr. Morris has been at great pains to estimate the proportion of individuals in which this congenital atrophy of one gland occurs, and from a large number of figures he reckons it as happening in 1 out of rather more than 3,500. Quoting again from the hospital statistics, there are 5 instances of aborted kidney in the *post-mortem* books of the Hospital for Sick Children. Two were on the left side, 2 on the right, and in 1 the side is not noted; 2 were complicated with imperforate anus and 1 had the foramen ovale patent; in another the suprarenal capsule was absent, and there was also hypospadias. In a girl, aged 10, who died after operation for cleft palate, the left kidney was atrophied and left ureter dilated. One instance occurred in which the right kidney was small, and consisted of three lobes; the left kidney was a bag of pus; the child died of uræmia. ⁴ *Annals of Surgery*, July, 1897. ⁵ *Lancet*, December, 1897.

THE WOUNDED IN THE MUTINY.—Deputy-Surgeon-General C. A. Innes has written to the *Army and Navy Gazette* to point out an error in Lord Roberts's book, *Forty-one Years in India*. Lord Roberts in Volume I writes: "Anæsthetics and antiseptics were then unknown, consequently few of the wounded recovered, and scarcely a single amputation case survived." Deputy-Surgeon-General Innes points out that chloroform had been discovered some time before 1857, and that during the siege and assault on Delhi all operations performed by him were done under chloroform. Antiseptics were unknown. As to mortality Deputy-Surgeon-General Innes says that in his regiment (the 52nd Light Infantry) 60 per cent. of the operations performed before Delhi recovered. There must be other medical officers who can verify or correct the latter part of the quotation from Lord Roberts's work.