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SOME POINTS IN THE TECHNIQUE OF KIDNEY OPERATIONS.*

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Among recent advances in surgery, operations upon the kidneys occupy a prominent place. The success of these operations is such that we are naturally encouraged to a more frequent employment of them in diseases of these important organs, the tendency of which, if unrelieved, is invariably to death. While some operations upon the kidney, as nephrotomy, are as old as surgery, and others, as both nephro-lithotomy and nephrectomy, done as accidental or casual operations, date back several centuries, most of them are of quite recent origin.

The first deliberately planned nephro-lithotomy was performed in 1880, by Henry Morris. The first nephrectomy was done in 1869, by Gustave Simon, of Heidelberg. The first nephrorrhaphy belongs to Hahn, of Berlin, who operated in 1881.

Operations on the kidney may be classified as follows:

Nephrotomy, or incisions of the kidney, including puncture.

Nephrorrhaphy, or fixation by sutures of movable kidney.

Nephrectomy, or removal of the kidney.

Nephro-lithotomy, or incision of the kidney for stone.

In this paper it is proposed to discuss briefly each of these operations, calling attention especially to valuable modifications

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applicable to nephro-lithotomy, by the employment of which some of the difficulties of that operation may be greatly lessened. In nephrotomy, an operation performed for various conditions, as suppression from impacted stone, cysts of various kinds, hydro- and pyonephrosis, the incision is made through the loin in the ilio-costal space, half an inch below and parallel with the twelfth rib, from the outer border of the erector spinæ muscle forward four or six inches, through all the tissues to the peri-renal fatty capsule.

This having been torn through and the kidney exposed, the future steps of the operation are based upon the conditions present. Additional space may be secured by a vertical incision extending from near the posterior end of the first to the iliac crest.

Nephrorrhaphy or nephropexy are terms applied to the operation of fixing a floating kidney by means of sutures connecting the renal capsule to the parietal wound. The incision is the same as in nephrotomy.

This operation is notably free from danger, and is strongly to be urged in all cases of floating kidney which cause much pain and annoyance, and are not amenable to instrumental support.

While the above mentioned operations, simple and remarkably free from danger as they are, have added brilliant lustre to to the glory of modern surgery, they are slight when brought in comparison with the immense benefits conferred by the two more difficult, and on account of the conditions calling for them, the more dangerous procedures, nephro-lithotomy and nephrotomy, operations which in point of importance and in certainty of results vie with any of the numerous operations in other fields, which adorn the history of modern aseptic surgery.

The most brilliant results of recent surgery are those obtained by nephrectomy, or removal of the kidney, which operation is done for tumor, for urinary fistula and for disorganization of the organ from various causes. It is also required occasionally after nephrotomy and nephro-lithotomy, and for movable kidney. Much of the success of the operation depends upon the condition of the opposite kidney. If sound, the chances are materially enhanced; if diseased to any extent, a fatal result is almost sure to follow. For determining this question as well as deciding definitely in obscure cases the point as to which kidney is

the diseased one, cystic endoscopy, is an available and practicable measure. By its employment the interior of the bladder is rendered visible by electric light illumination so that the vesical orifices of the ureters can be exposed, and the amount and character of the urine discharged by each into the bladder, definitely ascertained. There can be no doubt, however, but that the successful use of such apparatus demands the most skillful and experienced management.

Nephrectomy may be lumbar or extra-peritoneal, or abdominal or intra-peritoneal. The incision for the lumbar operation is the same as that described for nephrotomy and nephro-lithotomy, ample and sufficient room for ordinary sized kidneys being afforded in the ilio-costal space. Konig's incision is one made at first vertically along the outer border of the erector spinæ muscle to the crest of the ilium, through which the kidney is exposed, and the peritoneum detached and pushed forward while the lower segment of the incision is curved along the iliac crest and over the abdominal walls towards the umbilicus as far as the linea semi-lunaris. This incision is certainly free, but it not only possesses no advantages, but is more likely to be followed by hernia. There can be no doubt but that lumbar nephrotomy yields the best results when the conditions will admit of its performance, and that it should be the preferable method of operation. The kidney is easily accessible, the peritoneum is uninjured, if infection takes place the infected area is limited, a direct route for drainage is afforded, and if the organ is diseased in such a way as to preclude its removal, it is left under conditions less dangerous than it would be in other methods.

In large tumors of the kidney, the lumbar method is impracticable for the reason that sufficient space is not afforded for delivery.

After exposure and enucleation of the kidney, the pedicle, consisting of the vessels and ureter, are ligated in separate loops. Occasionally the operation has to be abandoned on account of adhesions.

The removal of the kidney by anterior abdominal section may be accomplished through Langenbeck's incision, made in the linea semi-lunaris, or through the linea alba. In the former, after

the incision through the parietes is made, the small intestines with the colon are pushed to the opposite side and protected with sponges and the posterior layer of the meso-colon incised vertically over the kidney.

Enucleation is done as in the posterior operation and the pedicle ligated as already described. It is only in exceptional cases that the abdominal method should be given the preference, as, for example, where uncertainty exists as to the condition of the opposite kidney, or when the operation is for large tumor. Not only is the success of the operation endangered by the necessary wounding of the peritoneum, but drainage, so frequently necessary after such operations, can be secured, not through the anterior wound but through an additional one made in the loin. Since by cystic endoscopy the condition of both kidneys can be ascertained, the usefulness of the anterior operation is limited to cases of large tumors or cysts of the kidney.

Nephrectomy may be rated as a very successful operation, as shown by statistics provided by Dr. Newman, and quoted in Treve's Manual of Operative Surgery. Out of 268 nephrectomies performed for various conditions, there were 94 deaths, thus giving a mortality of forty per cent. The mortality as given by the same authority is placed at thirty and five-tenths per cent. after the lumbar method, and forty-seven and one-tenth per cent. after abdominal nephrectomy.

Henry Morris, M.A., F.R.C.S., of London, performed the first deliberate operation for the extraction of stone from the kidney in 1880, and by his numerous operations since has done more to develop this special operation than any other surgeon. His statistics show a remarkably low rate of mortality. Newman has collected forty-two examples of the operation where the kidney was not extensively diseased, without a death. Tait records fourteen operations for stone with one death. Statistics show the operation to be unusually successful, when the magnitude of the undertaking is considered.

In discussing the points of the operation, as a matter of course, the question of diagnosis first presents itself. By attention to the rational symptoms and by careful study of the physical signs, the presence of renal calculus can be predicated with a reasonable degree of certainty. When in doubt and cir-

cumstances demand it, an exploratory lumbar incision can be made with as much reason, and with far less danger than the laparotomy incision, so generally approved of by the profession for exploratory purposes. Two methods of operation are employed, lumbar and abdominal. The posterior operation through the ilio-costal space is the safest, the surest, and the least difficult. The route through the anterior abdominal parietes was strongly advocated a few years back, and still has numerous adherents, on the ground that the condition of both kidneys can be ascertained and the danger of removing one kidney, a step frequently rendered necessary by the disorganized state of the kidney sometimes found, while the other is also diseased, may be thus avoided. The recent employment of cystic endoscopy renders the resort to this, the more dangerous method, on this account unnecessary.

As for the argument that the anterior incision affords more room for the necessary manipulation, it is only necessary to say that the lumbar incision affords the most direct route to the diseased organ and with the management to which I propose now to call attention, ample room is afforded.

Formerly the kidney was exposed through one of the several incisions mentioned above, in connection with nephrectomy and the search for the calculus prosecuted with the greatest difficulty and uncertainty through the depths of the wound with the kidney *in situ*. Naturally the search thus carried out, resulted many times in disappointment. Cases are recorded in which stones as large as a marble have been overlooked when the investigation was conducted in this manner.

In the case which I beg leave to insert here, I experienced this difficulty in a marked degree, and overcame it in a manner which I shall now proceed to describe.

In October 1891, I was called by the late Dr. C. W. Winn to see a German woman, aet. 53, a resident of this city, who for some time had been harassed with a train of renal symptoms, which pointed strongly to the presence of renal calculus of the right side. Briefly, the symptoms were occasional paroxysms of severe renal colic, attended with hæmaturia and pus in the urine, with, at times, scanty flow of urine, constant pain and tenderness on the right side over the kidney, the pains ra-

diating to points supplied by branches of the lumbar plexus of nerves and by the passage of small calculi after such attacks. The frequent paroxysms and constant suffering brought about such a condition of health, that relief became imperatively demanded. When seen in consultation, the patient was greatly emaciated, the quantity of urine reduced and invariably loaded with pus, the right renal region tender and, as shown by palpation, the kidney was somewhat enlarged, and a condition of hydronephrosis from probable impaction of calculus present, it was decided to perform nephro-lithotomy without delay.

Accordingly she was conveyed to the Hospital of the Good Shepherd, and a few days after her admission the operation was performed as follows. The transverse incision in the ilio-costal space, half an inch below and parallel with the twelfth rib was employed. The kidney was exposed without difficulty but although the patient was thin and the wound was ample, a satisfactory examination of the kidney was found impossible. Observing that the organ was very movable, it occurred to me that it might be brought entirely out of the wound upon the loin and then examined with both eye and hand. This was easily accomplished and the kidney having been drawn out, was twisted slightly on its pedicle so as to make it straddle the wound. The organ was carefully palpated and a suspicious point of induration having been detected, a long Hagedorn needle was passed through the cortex to this point and a grating sensation elicited which declared calculus present.

This fact was demonstrated satisfactorily to all present. An incision was made along the convex border through the kidney substance to the pelvis, the finger passed through the wound and the stone touched. In the effort to grasp it with a slender pair of forceps, it was dislodged and escaped into the ureter. I still attempted to reach it by passing long slender forceps into the ureter to the depth of six inches, but only succeeded in pushing it so far that it was deemed unwise and inexpedient to prosecute the attempt any further. Three days after the operation it was passed per urethram while at stool, with a good deal of pain. Hemorrhage from the renal wound was copious, but it was easily controlled by an iodoform gauze packing. The kidney was carefully replaced, drainage tubes

inserted and the wound closed by silk-worm gut sutures, except at the lower angle which was left open for the gauze packing. The subsequent progress of the case was in every way satisfactory. The oozing of blood and urine quite profuse at first, gradually lessened. The packing was removed on the fourth day. After three weeks the wound closed and the patient was discharged from the hospital. She has continued in excellent health since, with no reappearance of the old symptoms.

The point which I wish to emphasize in this case is the turning the kidney out of the wound upon the surface of the loin in order to permit of a thorough examination. On reflecting upon the ease with which this was done, it occurred to me that it might have been due to unusual mobility of the kidney. In order to satisfy myself on this point, I made a series of examinations upon twelve bodies at different times, and to my satisfaction found that it could be done upon either side with the greatest ease, and as proved by dissection without injury to either blood-vessels or ureter. The immense advantage secured by this method of drawing the kidney entirely out of its bed to the outside, can only be fully appreciated by one who has made the attempt to search for stone in the orthodox manner and as usually taught.

If in dead bodies the kidney can be treated in this manner without laceration of the vessels and ureter, how much less the danger of such an accident in the living body where these structures are so much more elastic and so much less friable.

Of course cases will be met with in practice, in which, from long standing disease, this treatment of the organ cannot be carried out, on account of close adhesions and the matting together of the tissues, but in the majority of cases operated upon for exploratory purposes, such obstacles do not exist and this important manœuvre can be accomplished.

The plan was original, in this my only case of nephro-lithotomy, with me for it was not until some time afterward that my attention was called to one of a course of lectures on the surgery of the kidney, by Henry Morris, of London, in the British Medical Journal, April 27th, 1892, in which he advocated the same plan and stated that he had been practicing it for a

number of years. Another point made by him, and referred to in the same paper, was the closure of the kidney wound by cat-gut sutures passed through its substance from back to front. He showed that not only was this the best plan of controlling a hemorrhage, which is occasionally alarming, but that the wound in the kidney thus treated, invariably healed rapidly.

Another point still demonstrated by this same authority is that the incision through the kidney to reach the calculus should be made through the cortex, rather than through the pelvis, as being less likely to be followed by urinary fistula.

By way of summary I would conclude with the following propositions.

1. Kidney operations as performed in the past few years have yielded remarkably successful results when the important character of the organs so attacked are considered.

2. In nephrectomy the posterior method is preferable, because it is more easily performed, it is safer and better adapted to all cases requiring removal of the kidney, except when the organ is too large to admit of delivering it through the limited ilio-costal space.

3. Cystic endoscopy is a most valuable means of determining the condition of the two kidneys and should be resorted to when the rational symptoms usually depended upon fail.

4. A most important point recently developed in the technique of the operation of nephro-lithotomy is the method established by Henry Morris of lifting the kidney out of the cavity upon the loin so as to allow of thorough examination for stone.

5. The other points established by the same surgeon are the readiness with which wounds of the kidney heal when sutured and the fact that incision to reach the calculus in nephro-lithotomy should be made through the substance and not through the pelvis, as being less liable to be followed by urinary fistula.