UNIVERSITY COLLEGE HOSPITAL.

Practical Clinical Remarks

ON

MEDIAN LITHOTOMY.

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GENTLEMEN,—I propose to bring before you to-day the subject of lithotomy, in connexion with the three cases of stone in the bladder we have had so recently in the hospital. I have already explained to you why, in one case, the patient was lithotomized, and the other two were cut. Both of these latter were cut by the "lateral operation"—the usual operation here, and, I believe, elsewhere. I intend to bring before you the reasons for preferring this operation to the modern one in the median line; and I wish more particularly to do so because it was a question with several persons whether one of these patients had not better have been cut by the median operation: however, as the lateral was perfectly successful, it is only reasonable to infer that it was the proper proceeding.

The history of the median operation affords an illustration of the mutability of professional opinion, and makes it appear as if there were a cycle in surgery, as in fashion, politics, and philosophy. The median operation was introduced some three or four hundred years ago, and continued to be practised up to the middle of the last century, when its tediousness, its painful character, and the excessive mortality following it, caused it to fall into disuse as soon as the safer and simpler method of Cheselden was introduced. Of late years, however, it has been revived under a somewhat modified form; and it is to this modern mesial operation, and its supposed advantages over the lateral, that I wish to-day to direct your attention.

The old median operation—called also the "Marian," from one Sanctus Marianus, who wrote on it, though it did not originate with him; and the "operation of the apparatus major," from the number of instruments used in it—was performed in the following manner, according to John Bell:—A grooved staff was introduced into the bladder, and the patient tied up in the usual way; the lithotomist then, kneeling or sitting before him, made an incision in the perinæum, not exactly in the raphé, which was thought to be dangerous, but very slightly to the left side, and terminating just above the anus. The knife was then carried on to the membranous part of the urethra, which was opened on the groove of the staff; and the knife being kept firmly against the staff, a long probe was introduced into the bladder by its side. The knife and the staff were now withdrawn, nothing but the probe being left in the bladder, and which was to serve as a guide into it. Along this, two iron rods, called "conductors," were now passed, and with these the operator dilated the prostate and neck of the bladder, by separating the handles—at least, he said he dilated them, but, as John Bell pithily observes, "he dilated, or, in plain language, tore open, the prostate gland." These conductors being held aside, the forceps was pushed into the bladder between them, and the stone extracted as best it could be got out.

The principles of this operation were—a limited incision in the membranous part of the urethra above the anus; dilatation, and not incision, of the prostate and neck of the bladder. Or, to use the words of Le Cat, "small incision; much dilatation."

Its results were, however, so unsuccessful, that it fell into entire disuse here, and almost so on the Continent, merely appearing from time to time under various modifications at one or other of the Continental schools. This condition of things prevailed

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till five years ago, when Mr. Allarton brought before the profession a modified form of the operation, and one which has now been pretty extensively practised, and of which some surgeons of much experience entertain a very high opinion. I will endeavour to compare this operation with the lateral, and point out to you in what respects it appears to me that the median is superior, in what inferior, to the lateral, and in what cases it might be employed instead of it. For in this, as in lithotomy, the surgeon should not be too exclusive; it is the duty of the surgeon to learn and to practise different methods of attaining the same end, and to make use of one or the other according to the requirements of the actual case before him, and to endeavour to select what is good and to reject what is doubtful in every method brought before him. It would be in the highest degree unsurgical to lithotomize only, or to cut only, every patient with stone coming under your care; and I believe there is a choice as to the cutting operation to be performed, and that, though as a rule the lateral operation is preferable, there are certain cases in which the median is to be preferred. This rule I have always endeavoured to act upon. Five years ago, very shortly after Mr. Allarton published his excellent little work, I cut a patient in this hospital by his method, because I thought the case peculiarly adapted to it; and last week, for the same reason, I cut a gentleman in private practice also by the mesial operation, and I believe that in this case that operation was the only one that was safely applicable. The two operations cannot with propriety be compared as a whole, as we have as yet no statistics with regard to the median; but so far as I can learn there is no reason to believe that this has been more successful than the lateral.

As to the mode of performing this operation, I will first speak of Mr. Allarton's method, and then allude to some modifications of it which I have found useful in practice. A staff, grooved along its convexity, having been entered into the bladder, the patient is tied up in the usual manner; the surgeon then, sitting in front, introduces his left index finger into the rectum, and feels for the apex of the prostate, against which he keeps it lodged, in order to judge of the distance of the prostate from the surface, to act as a guide to the knife, and prevent the rectum being wounded. A straight-backed bistoury is now entered half an inch above the anal aperture, and pushed straight forwards to a depth of about an inch and a half in the mesial line, so as to enter if possible the groove of the staff at the apex of the prostate. A small incision upwards is then made in the groove of the staff, and, as the knife is withdrawn, the incision in the skin is also extended upwards; the knife is then laid aside, and a long ball-pointed probe is introduced into the bladder along the groove of the staff, which is then withdrawn. The probe is now the only guide to the bladder, and up to this point therefore there is but little, if any, difference between the modern median and the old Marian operations, except that the incision is exactly in, instead of a little to one side of, the middle line. The forefinger is now introduced along the probe, and by working it forwards the prostate is dilated, and the finger gets into the bladder, when, the probe being removed, the forceps is introduced, and the stone extracted.

I have found it advantageous to modify this operation in one or two points. The first, I think of some utility, is to use—which I did in the last case in which I cut by the median operation, about a week ago,—instead of the ordinary curved staff, a rectangular one, grooved from about one inch above the elbow nearly to the point, like this I show you, corresponding to the "Glasgow staff" introduced by Dr. Buchanan. Its use and advantages are, that, when in the bladder, the angle rests against the apex of the prostate and can be felt in the perinæum, and you can judge of the exact point where to enter the knife (directing it so as to open the groove just below the angle), which you cannot do with the curved staff; the incision upwards also is limited, and there is, besides, less danger of wounding the rectum, the urethra being drawn upwards away from it, and not pushed down against it as with the ordinary staff. The knife should be straight backed, having the blade not more than two inches long; you can then tell to what depth you have entered it. I have found it advantageous in practice to carry a beaked director, shaped like a large hernia director, along the groove, after the incision has been made in the urethra, so as to open up the canal and thus to clear the passage for the finger. After having opened the urethra, I think it is better to dilate the prostate before withdrawing the staff: by pushing the finger slowly, with a rotatory movement, along its side, you get into the bladder with more ease and certainty; whereas if you only use the probe, you may find it not stiff enough, and you are apt to push the bladder before

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you. It has been proposed to employ mechanical means of dilatation, instead of the finger, to open up the prostate and neck of the bladder; and I have had some dilators constructed by Mr. Coxeter on the principle of the two-bladed dilator of the female urethra. I have used them on the dead subject, as some of you have seen, but I have not ventured to use them on the living, lest, by the employment of screw power, the same deep lacerations of the neck of the bladder should result that were so fatal in the old Marian operation. Indeed, I believe that their use would be fraught with danger from their liability to occasion rupture of the neck of the bladder, and if persisted in, I cannot but fear that they will bring discredit on the operation, reducing it to the condition of the old Marian, and repeating the dangers of that procedure. No safe dilatation can be effected except by the finger, with which no harm can be done, whilst it appears to me that the greatest possible mischief may be done with screw dilators.

In order to make a proper comparison between these two operations—the median and the lateral—we must take them seriatim. Now what are the dangers of the lateral operation? 1st, the difficulty in some cases of getting into the bladder; 2nd, hæmorrhage; 3rd, the risk of wounding the bulb; 4th, of wounding the rectum; 5th, of too extensive an incision in the prostate, and opening up of the pelvic fascia; 6th, the difficulty in extracting the stone.

With respect to the general ease and simplicity of the operation, there is no doubt the surgeon will be more skilful in that operation which he has more often performed: so far as ease and simplicity are concerned, there is no great difference between them. In the lateral operation there is very seldom any difficulty in getting into the bladder, though surgeons have sometimes been foiled in this; but surgeons of the greatest skill have also had great difficulty in getting into the bladder in the median operation. The bladder tends to get pushed upwards and backwards before the finger, especially in children in whom the prostate is not developed; and unless the neck of the bladder be well opened, there appears to me to be a danger of tearing across the membranous part of the urethra, and of pushing the separated bladder on before you. So far as facility in entering the bladder, then, is concerned, the two operations may be placed much in the same category.

As to the second danger—hæmorrhage. In this respect, the median has decidedly the advantage. If the incision be made in the middle line, without wounding the bulb, although there may be tolerably free bleeding at the time, yet there is no vessel that can furnish a dangerous consecutive hæmorrhage; whilst in the lateral there are the dangers of arterial and of profuse venous hæmorrhage, the knife coming into close relation with the artery of the bulb and others of some size. If the object were, therefore, simply to save blood, the median is so far better than the lateral. But, after all, the danger of excessive hæmorrhage in the lateral operation is but very small. With care, it will rarely happen that the patient loses a dangerous amount of blood.

Point third—wound of the bulb. This may occur in both, but is more difficult to avoid, and, indeed, very likely to happen, in the median, as the bulb sometimes so overlaps the membranous part of the urethra that it is difficult not to cut it; whilst in the lateral operation, by cutting low down, and entering the groove of the staff well back, and from below upwards, this may always be avoided. It is true that division of the bulb in the mesial line seldom gives rise to much hæmorrhage, but cases have occurred to my knowledge, though not in my practice, in which patients have died from this cause after the perineal section, the blood regurgitating back into the bladder, and filling that viscus.

With respect to the fourth point of comparison. The rectum is not in much danger in the lateral operation, unless it be distended. In the median, on the other hand, the rectum is in considerable danger. If you perform this operation on the dead body, you will find the back of the bistoury very, I may say uncomfortably, close to the finger in the rectum; and if you place another finger in the wound, you will find them come into very close apposition just anterior to the prostate. In the old Marian operation, the rectum used to be very frequently cut, air and faeces issuing from the wound.

Fifthly, as to the treatment of the prostate. I think this is very nearly the same in both operations. All are agreed that in the lateral operation but a limited incision should be made in the prostate and neck of the bladder, the opening being dilated with the finger, so as to avoid wounding the capsule of the prostate and the opening up of the pelvic fascia. The difference between an incision that opens the capsule of the prostate, and dilating this structure by the finger, is very great. The

great object in lateral lithotomy is not to open up the pelvic fascia, and it is difficult, if not impossible, to tear this with the finger. Take an aponeurosis out of the body; you will find it very difficult to tear; but touch it ever so lightly with the knife, it separates at once. So, in the median operation, you may dilate the prostate to a considerable extent without opening its capsule. I have used the word "dilate," but dilatation is an erroneous term. If you look upon the prostate, which is one taken from a dead subject on which I have performed this operation, you will find it to be torn—not simply dilated, but lacerated. As you see in this preparation, there is an actual laceration of the substance of the prostate, but not extending into or through its capsule. A laceration of the substance of the prostate is of no consequence, and only becomes dangerous when it amounts to rupture of the capsule, when it exposes the patient to the fatal accident of extravasation of urine and diffuse inflammation of the pelvic fascia. Now, in the lateral operation, in running the knife down the groove of the staff, you may certainly, unless care be taken, go beyond the limits of the prostate, and thus expose the patient to all these dangers. In the median, this cannot be done, if the knife be not used after the urethra is opened, the prostate being dilated solely with the finger. So far as this point, then, is concerned, I think that the median may be regarded as safer than the lateral operation, it being impossible to open up the pelvic fascia with the finger in the median, whilst they may be opened by the knife in the lateral.

Now for the last and most important part of the operation—the getting the stone out of the bladder. In lithotomy, your work is only half completed when you have entered the bladder; the most important part, that for which the operation is undertaken—the removal of the stone—has yet to be done. Here, I think, the lateral presents a decided and unquestionable superiority; so much so, that it must ever prevent the median becoming the operation for stone.

In performing the median operation you will find three points, or rather planes, of obstruction, between the surface and the interior of the bladder. The first is occasioned by the transverse muscles of the perinæum, and, perhaps, also by the under portion of the deep perineal fascia. In the lateral operation you cut across this plane, and lay open the ischio-rectal fossa, giving abundance of room for the manipulation of the forceps and the extraction of the stone, along the base of the triangle formed by the rami of the ischium and pubic bones. But in the median you have to extract towards the summit of this space, at the apex of a narrow triangle, having the transverse muscles forming a tense bar along its base, and offering a material obstacle to the introduction of the forceps and the extraction of the stone. The second obstacle lies in the prostate; but as it is easily removable by dilatation, it cannot be considered a serious one.

The third, the deepest and most important, is situated at the neck of the bladder. In this preparation you find here a narrow, tense ring at the neck of the bladder beyond the prostate, and this bar remains intact in spite of the dilatation and laceration to which the prostate has been subjected. On introducing the finger, you will feel it grasped tightly by this ring. This inner ring of the neck of the bladder cannot be dilated beyond a certain point. I have found by experiments on the dead subject, that it cannot be expanded to a size more than sufficient to extract a calculus of one inch in diameter without laceration or incision. The existence of this ring is the greatest barrier to the extraction of the stone, and its laceration or rupture is well known as one of the most dangerous and fatal accidents in lithotomy. It is in consequence of the obstacle offered by this that the median operation is not available for the extraction of large calculi. Such a calculus as that you saw me remove by the lateral the other day, two inches in diameter, could not have been extracted by the median operation without the employment of a serious, probably fatal, degree of violence, because it could not be got out without laceration or rupture of the ring of the bladder. But it may be said, what is easier, when the finger is in the bladder, than to push a probe pointed bistoury along it, and cut downwards and outwards, through these structures into the ischio-rectal fossa, if the stone be large? I answer, nothing could be easier or more simple; but what would be the consequence? Why you at once reduce the median to the conditions of the lateral operation. A free incision in the neck of the bladder and prostate increases the tendency to hæmorrhage, opens up the fascia, and exposes the patient, in fact, to all the dangers of an ill-contrived lateral operation, destroying at once and altogether the principle of the median operation—viz., dilatation, and not incision; and if you do not gain space by incision,

but attempt to extract a moderately large stone by dilatation of the parts, you will certainly not succeed, but your dilatation will end in a laceration, not only of the substance of the prostate, which is safe, but of the neck, and, perhaps, the base, of the bladder, which will be fatal.

In conclusion, then, it appears to me that the median operation, when performed in suitable cases, has the advantages over the lateral of being attended by less risk of hæmorrhage, and with less danger of injury to the pelvic fascia; but that in consequence of the very small size of the opening that can be made in the bladder by it, *provided these advantages are maintained*, it is only applicable to certain classes of exceptional cases, and that it cannot be substituted for lateral lithotomy as the general operation for stone in cases not admitting of lithotrity.

My opinion as to the particular cases in which the median operation may with propriety be performed is this: In cases of foreign bodies, such as pieces of bougie, bits of tobacco-pipe, &c., being lodged in the bladder, the median is preferable, the body being small and easily extracted; so also for stones not exceeding one inch in diameter. But then, it may be said, calculi of this size can generally be safely subjected to lithotrity. That is true; but, in certain cases, lithotrity is not admissible; so that the median operation becomes limited to cases of small calculi in which lithotrity cannot be practised in consequence of irritability of the bladder, or of the patient being too weak to bear it. If a small calculus be lodged just behind the prostate, in a pouch which occasionally forms at the lower fundus of the bladder, you may come down on it at once by the median incision. In cases also in which lithotrity has been performed, and the patient is unable to expel the fragments, you may perform the median operation, and readily extract the detritus by the scoop, as it lies behind the prostate. But where you have to do with a stone of large size, the median is not, in my opinion, safe; such an amount of traction must be used as will infallibly bruise and lacerate the neck and base of the bladder, and expose the patient to infiltration of urine and deep pelvic inflammation—to all the dangers, in fact, of the old Marian operation; dangers which were so great that more than half the patients subjected to it perished, and which caused it to be abandoned for the lateral.

Finally, in cases in which the patient is so anæmic that the loss of an additional ounce or two of blood might turn the scale against him, the median is preferable to the lateral, as although it is by no means almost a bloodless operation, as is supposed by some, yet there is less hæmorrhage during the performance, or rather, perhaps, less oozing after its completion, than in the lateral, and there is certainly not the danger of the profuse bleeding that is sometimes seen in that operation. It was for this reason that I performed the median in the last case that was under my care in private, and I am glad to say with success.

I have said nothing special about the performance of the median operation in children. Under the age of puberty, lateral lithotomy is a very successful operation; certainly the most successful of all the *great* operations in surgery. The median can scarcely be superior to it in this respect; and unless it can be shown to possess decided advantages over the lateral in ease of execution, it does not appear to me to be desirable to abandon an operation of proved safety for one that is still on its trial.

ON

CERTAIN POINTS OF PHYSICAL DIAGNOSIS IN MITRAL VALVE DISEASE.

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THE observations I have to offer are based, in part, upon 178 cases of cardiac disease, occurring under my care at the City Dispensary during the last four years. Of such I would first give the following general description:—Of these 178 patients with valvular disease of the heart, there were 90 males and 88 females. 90 of them had mitral disease; 71 had aortic disease; and 17 (9 males and 8 females) had both mitral and aortic disease. Of the above, rheumatic fever was the assigned cause in 58—viz., 35 with mitral, 16 with aortic, and 7 with both mitral and aortic disease. These 178 cases were noted in

7566 patients, or 2·38 per cent., but there were many not noted down, in consequence of the cases not having been accurately detailed.

With several of the cases of aortic disease well-marked tuberculosis was associated. Independently of those mentioned, there occurred also four cases of cyanosis, from malformation of the heart. Of the migratory patients composing this *series*, only two presented symptoms resembling angina pectoris, and in only two cases could I find that sudden death occurred; but all statistics of patients suffering from chronic heart disease, whether treated in hospitals or dispensaries, are necessarily untrustworthy.

I would, first, advert to two of the general physical signs common to all forms of cardiac disease: cardiac fremitus and musical murmur. With respect to cardiac fremitus, it was frequently observed in mitral disease, but invariably as a systolic phenomenon. No case of diastolic fremitus, limited to the apex, was recorded. In aortic disease, either systolic or diastolic fremitus was several times observed, the latter occasionally of marked intensity. And here I find my experience at variance with that of an observer of deservedly high celebrity, Dr. Walshe. This physician had not, at the time of the publication of the last edition of his excellent work, met with any instance of regurgitant fremitus. Lastly, with respect to musical murmur, I would observe that it was most rare at the mitral orifice, even as a systolic phenomenon; while, during diastole, it was never heard. At the aortic orifice, musical murmur was comparatively frequent, as an attendant upon both obstructive and regurgitant conditions, but almost invariably limited to systole or diastole alone. Furthermore, murmurs, whether systolic or diastolic, although generally conducted along, are not by any means walled in, as it were, by the vessels originating them, but radiate over the chest in all directions; and when intense, or *à fortiori* musical, they mask, more or less completely, the normal sounds of the remaining valves, so as to render their examination with any view to comparative or differential diagnosis for the greater part impossible. Upon this point I would lay especial stress.

The post-mortem examinations scarcely amount to 8 per cent.; but the symptoms and physical signs were carefully observed, the latter in accordance with the prescribed rules of exploration. Although difficulties must of necessity still exist with respect to the right interpretation of physical signs,—for example, rare cases have been recorded in which regurgitation existed without murmur, and others in which a murmur was only heard at a spot remote from its pathological site, as in one case narrated by Dr. Graves,—yet if with our present enlarged experience physical signs do not, in obedience to fixed laws, stand in a certain definite relation to their pathologic causes, physical diagnosis, as a science, must be regarded as impracticable.

It is, however, hardly to be expected that our knowledge of the pathology of the heart should have entire perfection so long as physiologists still differ as to the cause of the locomotion of the organ, of its rhythmic action, of its double sound, as also respecting the influence exerted upon it, mediately or immediately, by the nervous system. While Skoda and others, for example, in explanation of the heart's tilting movement, still adopt Gutbrod's exclusively physical recoil theory, powerful arguments have lately been adduced by Ludwig to show that the muscular tissue of the heart possesses within itself, by its tendency to change of form during systole and diastole, the power of causing the locomotion referred to. The theory of the cause of the rhythmic movements of the heart has also its opposing advocates. The latest and perhaps most generally adopted view is that which ascribes to the central cardiac ganglia the power of thus co-ordinating its movements. But even Volkmann, one of its most strenuous supporters, admits that it is only an hypothesis, and one, perhaps, difficult, if not impossible, to verify. On the other hand, Budge and Schiff, from their experiments, attribute a much greater power than Volkmann would accord to the blood, as the *primum mobile* of the heart's rhythmic beating.

While admitting the controlling power of the nerves, I have been content to adopt, with slight modification, the old Hallerian view, that the sequence of systole and diastole is purely one of muscular action, conditioned upon the chemico vital changes induced by contact of blood with this tissue. I conceive that the heart's alternating systolic and diastolic action is, in the healthy subject, maintained by two causes: the one intrinsic—the contact of blood, in given quantity, with the endocardial membrane; the other extrinsic—the blood injected by the coronary arteries into the proper tissue of the muscle; and that the concurrence of these two causes seems absolutely