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LITHOTRITY





UNIVERSITY OF EAST ANGLIA



LITHOTRITY



CHARLES HAWKINS

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

*With the Author's
Compliments.*

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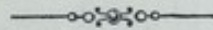
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LITHOTRITY.

FROM

A SYSTEM OF SURGERY, THEORETICAL AND PRACTICAL,
IN TREATISES BY VARIOUS AUTHORS,
EDITED BY T. HOLMES, M.A. CANTAB.



THE amount of mortality attending the operation of lithotomy in the adult has always made it a question of paramount importance with Surgeons to discover some more successful method of removing a calculus from the bladder.

It is not necessary here to allude to the attempts made from time to time to get rid of the calculi by injecting solvents into the bladder.

The removal of calculi from the bladder through the urethra was effected by Sir Astley Cooper and Sir Benjamin Brodie before the introduction of lithotrity into practice. These Surgeons were in the habit of removing small calculi with an instrument called an urethra forceps. Sir William Blizard is also said to have performed this operation. And in this way patients were successfully relieved of small calculi; in one case as many as a hundred being thus removed.

To give a detailed account of the early history of lithotrity would now be of little interest. Whether the credit of originating the operation is due to the Spanish monk or to the Indian officer—who both performed an operation on themselves for the purpose of breaking a stone in the bladder—is not now of much importance. It is admitted that to M. Civiale we are indebted for the operation as practised at present.

Among those who have written on the subject, and whose works may be consulted for a history of the operation in all its earlier stages, are Gruithuisen, Elderton, Civiale, Amussat, Leroy d'Etiolles, Heurteloup, King, Costello, Bellinaye, Coulson, and others.

Baron Heurteloup was among the earliest who performed the operation in this country. At first, several instruments were used by him, such as the *percepierre*, *trois branches virgule*, *évideur* or forceps, &c.; the intention being to seize the stone, and break it up by drilling holes in it: he eventually made use of an instrument invented by Mr. Weiss, called the sliding forceps, to which he applied a hammer, the stone being broken by percussion. All these instruments and modes of operating have been for many reasons superseded by the plan now in general use, viz., crushing the stone by means of the lithotrite.

Sir Benjamin Brodie, who paid great attention to lithotrity on its first introduction, and to whom is due much of the simplicity of the present mode of operating, says, in his 'Lectures on Diseases of the Urinary Organs': 'Many years ago Mr. Weiss made an instrument on the principle of what I have called the sliding forceps, having a screw* attached to it for the purpose of dividing calculi while still in the bladder into fragments; but it was of rude construction, and, such as it then was, was certainly not fitted for use on the living subject.' 'Baron Heurteloup at first pursued M. Civiale's method of operating; but finding it liable to some very serious objections, he adopted the principle of the sliding forceps invented by Mr. Weiss, at the same time modifying its shape so as to render it more convenient for being passed into the bladder, and for seizing and retaining the stone afterwards. Besides this he made another change in the instrument, rejecting the screw, and substituting for it a peculiar apparatus which enabled him to crush the calculus by a stroke of the hammer. Now the first of these alterations, made by Baron Heurteloup, I believe to have been of

* The application of the screw was first suggested by Mr. Hodgson, President of the Royal College of Surgeons of England, formerly Surgeon to the Birmingham Hospital, who early practised lithotrity. He had been a successful operator, having performed lithotomy eighty-six times, with only four unsuccessful cases: he was the Surgeon referred to by Sir Benjamin Brodie in his work on *Diseases of the Urinary Organs*, as having recommended in lithotomy in the female, division of the urethra immediately below the symphysis of the pubes.

essential importance; in fact, without it, the instrument would have remained wholly inapplicable to any useful purpose. But as to the second alteration, I cannot say that anything that I have seen, either in my own practice or in that of others, would lead me to regard it as being any improvement whatever.'

Sir Benjamin Brodie in his early operations was accustomed to use an instrument—a scoop lithotrite—so constructed that a portion of the crushed calculus always remained within the blades; by this means a considerable quantity was removed at each operation by the repeated introduction of the instrument. But this method was attended with great objections; the withdrawing the instrument loaded with fragments stretched the urethra beyond its natural size, giving much pain at the time, as well as afterwards. When the urine was passed, it was occasionally attended with some bleeding, and in some instances the urethra was torn, fragments lodging in the torn portion; infiltration of urine, followed by perineal abscess, were the consequences, and in two such cases death resulted. In referring to these cases, in his 'Notes on Lithotritry' in the 38th volume of the 'Medico-Chirurgical Transactions,' he says: 'The experience of these cases led me some years since to discontinue the use of the forceps already referred to, or at least to have recourse to it very rarely, and only under some special circumstances, and to substitute for it a forceps made by Mr. Weiss, in which there is a longitudinal opening in the curved part of the fixed blade, with a corresponding projection in the opposite or sliding blade. The effect of this instrument is to crush a calculus very completely, and in such a way that no part of it remains between the blades, the whole being left to be passed with the urine afterwards. The ultimate cure of the patient may in some instances be thus a little (but not greatly) protracted; but this inconvenience is more than compensated by the smaller amount of pain which the patient suffers, the smaller liability to rigors, and the complete absence of danger from the infiltration of urine and perineal abscess.'

This instrument, now called the 'screw lithotrite,' is the

one in very general use. Alterations have been made in it. The rack and pinion, applied instead of the screw, was originated by Mr. Fergusson, and is used by that Surgeon. Mr. Coxeter, and more recently Mr. Weiss, have also made alterations, by which it is intended to allow of more rapidity in operating, and to gain lightness in the make of the instrument; but I must confess that, notwithstanding the high authorities in favour of these alterations, I cannot consider them in the light of improvements. The instrument just described has, I think, still advantages over any other; it is simple in construction, quite as light as it is safe to have it made, and it is not so liable to get out of order as those of a more complicated construction.

It may be as well first to describe the methods of performing the operation, and then to consider the cases to which it may be applied.

When the symptoms are such as to lead one to suspect that a patient has a calculus in the bladder, should there be any considerable amount of irritation of that viscus, and instruments have not previously been used, it is well to keep the patient confined to the sofa for a day or two before any examination is made; and should the general health need it, to give such medicines as may be necessary.

In examining the bladder, instead of using a sound, the better mode is, having placed the patient on a sofa, with the pelvis raised by means of a pillow, to inject into the bladder through a silver catheter about four or five ounces of water; to the catheter should be attached a stop-cock, so that the water may be retained in the bladder during the examination. If the stone be of any size, it is usually detected by means of the catheter; but should this not be the case, the lithotrite may be introduced, and an examination made in the same manner as will be described when it is used for crushing the calculus.

Having ascertained the presence of a stone, and decided that lithotrity is the operation to be performed, it is necessary to place the patient in as favourable a state as possible for what he has to undergo. One of the first requisites is, that

the bladder should be able to contain a sufficient quantity of water to render the necessary use of instruments safe; and it is not unfrequently required, on account of the intolerance of the bladder to a sufficient quantity, to inject the bladder, and keep the water in for a short time on one or two occasions previous to the introduction of the lithotrite. After such treatment the bladder usually retains the necessary quantity. If an extreme irritability should continue, so that at least four ounces of water is not borne, the administration of an injection (containing twenty or thirty drops of laudanum) per rectum most frequently accomplishes the desired object. It is also necessary in some cases where instruments have not been previously used, or where there is any difficulty in introducing them, to pass an instrument a few times on different occasions before proceeding to crush the stone.

The bladder and urethra being thus prepared, the following is the mode of proceeding to be adopted. The patient should the day before take a dose of aperient medicine, and be confined to the house for a couple of days, so that the urinary organs should be in as quiet a state as possible. The patient being placed on a sofa, with the pelvis raised as before described, from four to six ounces of warm water should be injected into the bladder; it is as well to have the piston of the syringe graduated, so as to know exactly the quantity of water injected. Should there be much spasm, so that the bladder resists the introduction of the water, this part of the operation must be conducted slowly, only a small quantity being introduced at first; indeed, if it is found that the bladder will not retain the requisite quantity, the further performance of the operation must be postponed to a future occasion. In some cases, where this intolerance continues, the following plan may be adopted: desiring the patient to retain the urine for as long a time as possible previous to the operation being attempted, and the Surgeon being satisfied that a certain quantity of urine is in the bladder, he may introduce the lithotrite, and crush the stone *once*; when a stone has been once crushed, this irritation of the bladder not unfrequently ceases. It is the practice of some Surgeons not to inject any

LITHOTRITY.

water into the bladder before the introduction of the lithotrite. I have found that the bladder more readily retains the water injected, than the urine that may be in the bladder when the lithotrite is introduced.

The principal requirement in the operation of lithotrity is, that the calculus should be broken into pieces of such size as may be readily passed; and it is to be considered what is the best method of accomplishing this with as little disturbance to the bladder as possible. The size of the instrument must depend in some measure on the supposed size of the stone, which there is no method of ascertaining with any very great accuracy; if the stone is not large, a medium size is all that will be required; but should there be any doubt as to the size of the stone, a large instrument should always be used on the first occasion of operating.

The introduction of a lithotrite, from its shape, is more difficult than a catheter; and the passage of a lithotrite through the neck of the bladder requires caution and dexterity, and some amount of pressure is occasionally necessary. Where there exists much enlargement of the prostate gland, considerable difficulty is occasionally met with; but with proper manipulation this is overcome. It is of the greatest moment, in this step of the operation, that no attempt should be made to open the blades of the instrument until it is completely in the bladder; much mischief is sure to ensue if such an attempt is made. The next step is the manipulation necessary for the seizing of the stone; on this great authorities differ. Sir Benjamin Brodie, in his 'Notes on Lithotrity,' says: '*The rule should be to move the forceps in the bladder as little as possible, never using it as a sound for the purpose of exploring the bladder, or ascertaining the position of the calculus.* Such an examination does not assist the Surgeon in seizing the calculus afterwards; it gives pain to the patient, excites the bladder to contract and expel the water which had been previously injected; and I know that instances have occurred, though not in my own practice, in which a rough handling of the forceps has caused great injury to the bladder, ending in the death of the patient. The rule for seizing the

calculus (which I must acknowledge to have first learned from witnessing the very dexterous operations of M. Heurteloup) is as simple as possible. The patient lying on his back, the handle of the forceps is elevated, which of course brings the convex part of the curved extremity of it in contact with the posterior surface of the bladder, where it is contiguous to the rectum. The forceps is then to be opened by withdrawing the sliding blade to a greater or less extent, according to the probable size of the calculus, the fixed blade being at the same time pressed gently downwards in the direction of the rectum. The object of this manipulation is, that the forceps, being below the level of the other parts of the bladder, the calculus may fall into it by its own weight; and it is generally successful. If it should not do so, the forceps, without being moved from its situation, may be gently struck with the hand on one side, or on its anterior part, and the slight concussion thus communicated to the bladder will probably be sufficient to dislodge the calculus, and bring it within the grasp of the instrument. If it should be otherwise, the forceps, being closed, may be very gently and cautiously turned to one side or the other, so that the curved extremity of it may make an angle of 25° or even 30° with the vertical line of the body, then opened, and pressed in the direction of the rectum in the manner already described.

‘When the prostate gland is much enlarged, there is sometimes a difficulty in seizing the calculus, arising either from it lying under that part of the gland which projects into the bladder, or from the impediment which it offers to the elevation of the handle of the instrument. For such cases, the operating-table invented by M. Heurteloup, which enables the patient’s shoulders to be suddenly lowered, is very convenient; or the same purpose will be answered sufficiently well if the patient be placed on a light sofa, the end of which may be raised by an assistant. The calculus is then seized, not in that part of the bladder which adjoins the rectum, but in the fundus, this being rendered the lowest point by the elevation of the pelvis.’

M. Civiale recommends another method, thus described

by Mr. Henry Thompson in his late work 'On Lithotomy and Lithotrity:' 'The other mode is that of Civiale. Its principle is the reverse of the preceding. By position of the patient, the centre of the bladder and space beneath it are selected as the area of operation; no depression is made; contact between the walls of the bladder and the instrument is, as much as possible, avoided. The instrument is applied to the stone in the situation which this naturally takes, and the operator carefully avoids moving it, or any movements of concussion whatever, however slight. It is only due to the distinguished operators first named to say that this, the modern, and it is believed the improved, method, is in part due to the mechanical improvements which have been made in the lithotrite of late years. The method was scarcely possible until the present instruments existed.

'We shall now consider it in detail. The blades having entered the cavity of the bladder, the instrument slides easily and smoothly down the trigone, which in the living and healthy organ is an inclined plane, although quite otherwise in the atonied and in the dead bladder.

'In many cases the stone is grazed by the instrument as it passes, and the slightest lateral movement of the blades right or left will determine on which side it lies. If so, the operator is careful not to disturb it, but he inclines the blades *slightly away from the side on which it lies*, carrying the instrument gently in towards the posterior wall of the bladder, while the male blade is slowly withdrawn. It is important always to bear in mind, that as long as the blades are near the neck of the bladder, the male blade cannot be withdrawn, since it would impinge on that sensitive part, and cause pain or injury. Having done so, he now inclines the well-opened lithotrite towards the stone, slowly closes, and almost certainly seizes it.

'But suppose no stone was felt on entering, he is then directed simply to withdraw the male blade an inch or more in the middle line, to incline the blades to the right side about 45° , and then to close them, without altering the axis of the shaft, or otherwise disturbing the central position of

the instrument. Thus in almost all positions the stone is seized sideways by the blades of the lithotrite, and very rarely by their extremities. If no stone is felt, he turns them, opened, to the left in a similar manner, and then closes them. Observe, that the blades are always to be opened before they are turned, for this reason: if the turn is first made and the blades are subsequently opened, the chance is that the male blade as it is withdrawn will move the stone away; whereas if the blades are inclined while open, the stone, if there, is almost certainly seized. This is one of the many apparently minute but extremely important points of which systematic lithotrity is made up. To return: it is very rare that the stone will elude the search thus far; but if it does, depress the handle of the lithotrite half an inch or so, which raises the blades very slightly from the floor of the bladder, and turn them another 45° to the left, bringing, in fact, the blades horizontal to the left; close: if unsuccessful, turn them gently to horizontal on the right, and close. These five positions (vertical, right and left incline, right and left horizontal) explore the bladder fully, middle, right, and left, and will almost certainly find any stone of a moderate size in a healthy bladder. The object is at the same time strictly to avoid communicating any jerk to the instrument or to the bladder. In all these movements, if properly executed, there has been barely contact of the lithotrite with the vesical walls; at all events, no pressure, nothing to provoke undue pain, or cause contractions of the bladder. If, however, there is an enlarged prostate, causing an eminence at the neck of the bladder, a depression behind it, or the stone is very small, or we are exploring for some fragment, at the close of the case, which is suspected to have eluded previous search, the blades may be reversed so as to point downwards to the floor, and the object sought may then often be secured with ease. If seeking for a small stone or for fragments, we shall employ a lithotrite with short blades, which can therefore be reversed with much greater ease than one with long blades.

‘In order to do this properly in the normal bladder, the handle of the lithotrite is depressed another inch or so,

between the patient's thighs, so that the line of the instrument, instead of being directed obliquely a little upwards, is level with, or even points a little below, the horizon; the blades, supposed to have been already brought to the horizontal as before described, are cautiously turned, about 45° say, to the right (right reversed incline), so as to point obliquely to the floor, which should be barely felt, or very lightly touched by them. No pressure should be made on this part of the bladder by any part of the instrument, and it is easily avoided by depressing sufficiently the handle of the lithotrite. Then close the blades; next, turn them back, that is upwards, over to the left (left reversed incline), and close. Lastly, they may be brought round, to the reversed vertical position, and the floor lightly swept: this requires the maximum depression of the handle, and is only necessary to pick up small fragments with a short-bladed instrument. But when the prostate is considerably enlarged, and a stone or fragments have to be sought behind it, the lithotrite is reversed without depressing the handle.

'All these movements are to be executed at or beyond the centre of the vesical cavity, the proper area for operating, without hurry, rapid movement, or any other which partakes of the nature of a jerk or concussion, and, if in a fairly healthy bladder, without causing more than a very slight degree of pain to the patient. The operator's eye is also to be so familiar with the scale marked on the sliding-rod, that he knows at a glance the exact interval which it indicates as existing between the blades in the bladder.

'It is essential to good practice, while manipulating the lithotrite, to maintain the axis of the instrument, as far as possible, always in the same direction. The blades only are to be moved; the shaft should occupy the same inclination, unless when this is intentionally altered. In screwing home the male blade, the operator is very apt to move the lithotrite also, at each turn of the screw, unless he is conscious of the care necessary to avoid this evil. All lateral movements, all vibration and concussion, necessarily tell on the neck of the bladder and prostatic urethra, where the instrument is most

closely embraced, and its mobility is most limited. To that part of the lithotrite which occupies the anterior portion of the urethra much freedom of lateral movement is permitted, and in the bladder the instrument is free, although in a less degree; but the axis, or fixed point, as regards lateral movement, is at the part indicated, which is also the most sensitive spot of the entire passage. Hence the aim of the operator should be to produce in this situation no motion of the lithotrite, except that on its own axis. Few of the details of the operation require more practice to master than this.

‘There is one important rule with reference to the situation of the calculus in the bladder. The larger it is, the more certain it is to be found lying near to the neck of the bladder, in the ordinary recumbent position, while a small one is usually detected at the back of the trigone. This position of the large stone requires a different method, and it will be found almost invariably successful. The moment the lithotrite enters the bladder, it is not to be pushed onwards to the bottom of the cavity; first, let the blades be inclined away from the side on which the stone is felt, then push on the female portion of the instrument only, by itself as far as it will go, maintaining the male blade at the neck of the bladder; it is now only necessary to incline towards the stone, and it will be seized almost certainly at once. But if the operator commences by pushing on the whole instrument, and then withdraws the male blade according to the ordinary custom, this blade is infallibly drawn against the large stone, which it therefore fails to catch, and presses it back against the neck of the bladder, producing pain, irritation, and perhaps bleeding: this is a practical rule of importance. As already intimated, for a small stone, the instrument glides down to the posterior wall of the bladder, the male blade is withdrawn, and the stone caught in the usual manner.

‘Such then, in the main, is the method of Civiale for finding the stone; the other, or English method, is without doubt an efficient one, but I believe it to be more irritating

to the bladder, and less certain for removing every minute fragment towards the end of the operation, while it fails to deal efficiently with a stone lying behind an enlarged prostate. Hence the crushing operation has been often said to be inapplicable when such disease exists, a conclusion wholly unwarranted by the practice and results of modern lithotrity. Having tried both methods myself, I have no hesitation in preferring the former.'

Notwithstanding the opinion thus strongly expressed by one so competent to come to a right conclusion on this matter as Mr. Thompson, I am still inclined to prefer and to recommend the method practised with so much success by Sir Benjamin Brodie, as the one less likely to cause irritation of the bladder; and I have not found it attended with the disadvantages described by Mr. Thompson. The calculus being seized, by either method the question then arises—how often should the process of crushing be repeated? In the first operation, the Surgeon should often be satisfied with crushing the stone but once, especially if the bladder is irritable. One crushing frequently relieves the patient of much pain and irritation of the bladder, particularly in the case of large stones, and it is well to give the patient as little inconvenience as possible at the first operation, so that he may look to a repetition without dread. On the occasion of first seizing the stone, I usually move the instrument gently to either side, to ascertain if there be more than one stone. The lithotrite being carefully withdrawn—care being taken that the blades are quite closed—the patient should at once go to bed, taking a glass of warm wine-and-water or brandy-and-water, and be kept warm, in order to prevent his having a rigor; he should for the next twelve hours make water in the recumbent posture, and be confined to the house until the next operation.

The period that should elapse between the operations must vary: if at the first operation the calculus has been crushed once only, unless it be a small one, in all probability no fragments will be passed; in which case the operation may be repeated usually in three or four days. During the intervals

between the succeeding operations, the patient may be allowed to take a certain amount of exercise.

It is of considerable importance to determine how much should be done at each operation; on this question Surgeons differ. Some do a great deal, whilst others are satisfied with seizing the stone only once or twice, and repeating the operation at much shorter intervals. Some place the patient under the influence of chloroform, and continue seizing and crushing the stone until the whole is broken up, at one operation. This latter plan is accompanied with this disadvantage: where a large stone is thus crushed into pieces capable of being passed, the passage is liable to be blocked up with the fragments, which results in a difficulty in getting rid of them, and much consequent irritation of the parts. The wiser plan is to adopt an intermediate method, and to do at each operation so much only as the patient can bear without great inconvenience, so as to render as few operations as possible necessary; whilst, on the other hand, the patient is not distressed by the manipulations being continued too long at one operation. From five to ten minutes is the average time the lithotrite should be employed in the bladder.

The interval there should be between the performance of the operations, is the next question to be considered. As a rule, I never repeat the operation whilst any fragments are being passed, and I usually allow one or two days to elapse after the fragments have ceased to come away; this usually requires about a week between each operation.

With regard to the removal of the fragments by means of an instrument, I have found no reason to alter an opinion I formerly expressed, and which was published in the 'Transactions of the Pathological Society' for the year 1850:

'In relation to the occurrence of infiltration of urine, and abscess after lithotrity, Mr. Charles Hawkins thus expresses himself: He believed this accident might be entirely avoided, if the operation of crushing be performed with the lithotrite—that is, if the operator is satisfied with crushing the stone, and not attempting to withdraw the fragments between the

beaks of the instrument. He believed this accident never occurred except where the urethra had been lacerated with a piece of stone during the withdrawal of the instrument; then impaction of a fragment led to the results which the preparations exhibit; but where the urethra has not been lacerated, impaction is of little importance, and no dangerous symptoms are likely to result from such an occurrence. . . . Since no attempts have been made to remove fragments from the bladder in the instrument, he had met with no such accident. . . . As far as his experience went, it was not necessary to attempt the removal of stone in the scoop-lithotrite. If the stone is *well crushed*, it may be left to nature for the bladder to be evacuated of the fragments; or where there was a difficulty in passing them, he had removed much by means of washing out the bladder.' ('Path. Trans.' part i. of vol. iii. 1850, pp. 123, 4.)

It is not necessary to introduce the lithotrite more than once at each operation, if the plan described be adopted; nor is it requisite to draw off the water when the lithotrite is withdrawn. It is desirable that some water should be left in the bladder; it renders it better able to bear the presence of the broken stone. In performing lithotripsy, this rule should be invariably followed: *to introduce an instrument into the bladder as few times as possible.*

When there is much enlargement of the prostate gland, and the patient on this account is unable to pass very small fragments, and their removal has not been effected by means of the catheter, the best mode of proceeding is to make use of the scoop-lithotrite; and one end of the sofa on which the patient lies being raised by an assistant, the fragments fall into the instrument at the fundus of the bladder, that part by this plan being now the lowest portion.

Among the difficulties that may arise during the treatment of a case are the following: Sometimes after the first operation retention of urine occurs, but not very frequently when the bladder is in a healthy state, and where too much has not been attempted: this must be met in the usual way, by the use of the catheter. A fragment of stone may be re-

tained in the passage, after it has left the bladder, in cases where there has been no laceration of the parts: as before stated, this state of things, although troublesome, is not dangerous; and when the fragment lodges in the membranous or prostatic portion of the urethra, a full-sized gum catheter should be used, and the piece gently dislodged and pushed back into the bladder. Many ingenious instruments have been devised for the purpose of seizing and removing fragments thus arrested; but of all, the catheter will be found the most simple and most useful. Should the fragment be retained in the anterior portion of the urethra, it usually makes its way out in course of time; to facilitate this, the patient should retain the urine for as long a time as possible, and pressing the penis at the other side of the stone for a short time when the bladder is about to act, the piece is washed out. Fragments sometimes lodge just behind the meatus; with a common dressing-forceps they may be removed from this position; in a few cases it may become necessary to make a slight incision in the lining membrane of the urethra. The passing of fragments sometimes gives rise to inflammation of one or both testicles; this may delay the operation. The chief cause of mischief to be apprehended is when there is considerable irritation, followed by inflammation of the bladder, the urine depositing a quantity of ropy mucus, giving rise to great pain in the passage of water, and a constant desire to pass it. These cases require very careful treatment; depletion is rarely necessary: with the use of the warm bath and the administration of opium and hyoscyamus, the patient being kept to his bed or the sofa, the attack usually passes off. But these are signs that the bladder will not bear any lengthened operations. This state of bladder is sometimes caused by a fragment of stone, which is both too large and too small—small enough to enter the neck of the bladder, but too large to pass further; in this case, notwithstanding the irritation that may be present, the lithotrite should be introduced and the fragment crushed, when generally the symptoms subside. The bladder will in many cases continue to secrete a quantity of ropy

mucus as long as any stone remains, so that there is no reason for not proceeding with the operation; the patient may take daily half a pint of the decoction of the Pareira brava; but the treatment really requisite is the removal of the stone. Nevertheless these cases are occasionally not so easily managed, and sometimes it may be necessary to cease all operative proceedings for a time, until the bladder becomes in a more healthy state; it may, indeed, happen that the attempt to remove the stone by lithotrity must be abandoned: this, however, occurs but very rarely; usually, with proper treatment, these unfavourable symptoms are overcome, but not always. Sir Benjamin Brodie, in his 'Notes on Lithotrity,' relates the following case:

'In a fourth case, a very small calculus was crushed with great ease by a single operation. The operation was succeeded by a rigor, which terminated, as is usual, in a perspiration. A disturbed state of the system followed, marked by a frequent pulse, a furred tongue, and much prostration of strength; and attended with a deposit of adhesive mucus, but not in large quantity, from the urine. These symptoms continued, and after some time an abscess presented itself in one groin. The abscess having been opened, a considerable discharge of matter took place, and was followed by great relief* as to the general symptoms. The patient seemed to be in an improving state, when, between four and five weeks after the operation, he suddenly expired.

'On examining the body, no remains of the calculus were discovered in the bladder. The mucous membrane of the bladder bore marks of inflammation. There was an abscess of the pelvis, occupying the space between the bladder and rectum, and extending in the direction of the abdomen as high as the groin, in which the puncture had been made. The parts were carefully dissected and examined by the late Mr. Vincent (who had attended the patient with me in consultation), by Mr. Charles Hawkins, the Curator of the Museum of St. George's Hospital, and myself; but no lesion could be detected of the bladder, nor any kind of communication between the bladder or urethra and the abscess. Still

I cannot doubt that the abscess was somehow the result of the operation. Probably a very small splinter of the calculus might have penetrated the coats of the bladder, allowing the escape of a very minute quantity of urine into the cellular membrane. This would be quite sufficient to account for an extensive suppuration, at the same time that it is easy to suppose that so small a puncture might at once have closed, so as to be invisible afterwards.'

In this case the cause of death I believe to have been fatty degeneration of the heart; and had this disease not existed, I have little doubt but that the patient would have got well of the operation.

In those cases where a fragment becomes impacted in the urethra, usually in the membranous portion, and where the parts have been lacerated, in all probability such an accident will be followed by infiltration of urine and perineal abscess; the Surgeon must lay open the abscess freely. In two cases where this treatment was followed the patient ultimately recovered.

The number of times it may be requisite to repeat the operation must necessarily depend upon the size of the stone—the amount of crushing that is performed at each operation—and the facility with which the fragments are passed. Some patients pass very considerable-sized fragments; others require the pieces to be very small, necessitating more frequent operations. In the cases operated on by Sir Benjamin Brodie, with those that have occurred in my own practice, the number of operations averaged between six and seven; one or two operations sufficing in many cases of small stones. Mr. Prescott Hewett has operated in one case as many as nineteen times, and with ultimate success.

It is occasionally a wise plan, in cases in which there have been many operations, and the patient begins to feel the confinement and the recurrence of the operations, to cease altogether for a time, so as to allow him to recover his usual health; of course before dismissing the patient as cured, the Surgeon must be satisfied, by examining the bladder, that no stone remains. In some cases where the fragments are too

small to be seized by the lithotrite, or rather where, from their size, they fall through the opening in the blades of the instrument, and yet do not pass, the introduction of a full-sized catheter (which should be retained in the bladder for a short time) will enable the patient to void them.

The placing the patient under the influence of chloroform is by some Surgeons much recommended. As a rule, I do not think it advisable to make use of it, but only to have recourse to it in those cases where circumstances may render it necessary. In ordinary cases there is not only no occasion for it (for lithotrity, if properly performed, is not a painful operation), but, on the contrary, it is as well to do without it on account of the operator being thus better able to ascertain to what extent the patient can bear the operation at each time, so that he should not proceed so far as to cause the bladder to resent the operative proceedings. The bladder does not retain the water so well when chloroform is employed. When patients are peculiarly sensitive with regard to the operation, chloroform must be administered; for without it such patients could not be induced to submit to the operation, however favourable their cases might be in other respects. I operated on a patient twenty-four years of age, who had symptoms of calculus when a child. They had for many years remained dormant, but had recurred about four years before he consulted me, at which time he was making water incessantly and with intolerable pain, the urine depositing a large quantity of ropy mucus mixed with blood; in fact, the bladder being in as unpromising a state as possible for any operation. Having seized a very large stone with the lithotrite, I was unable to proceed with the operation on account of the patient being unable to exercise the necessary control over himself; but, under chloroform, I was enabled to effect a complete cure in five operations. It would have been impossible to have done this without the aid of chloroform. In the 41st volume of the 'Medico-Chirurgical Transactions,' I have related a case in which I operated successfully on a patient in whom there was a communication between the bladder and intestine. The calculus, the nucleus of

which was some vegetable matter, was of such a size that I could scarcely seize it with a very large lithotrite. The patient was enduring such dreadful sufferings that he was anxious to be placed under the influence of chloroform; but on the third occasion of operating, it was done, at his request, without chloroform; the operation was borne as well as when chloroform was used, and the bladder held more water. In such cases chloroform is very useful; but, in the majority of cases, it is not requisite, and not being requisite, it is as well not to have recourse to it.

In considering in what cases lithotrity is to be preferred to lithotomy, it may be observed that the early writers on the operation were of opinion that only where the calculus was very small, requiring but one or two operations—the bladder and kidneys perfectly healthy—was lithotrity available. Further experience, together with the great improvement in the instruments used and in the mode of operating, have tended in a great measure to alter this opinion. No doubt the frequent introduction of instruments when the fragments were removed within the blades, causing unnecessary disturbance to the bladder, and the stretching and not unfrequently the laceration of the urethra, rendering it in a very unfit state for the passage of fragments, led to most dangerous accidents; but since the practice of removing the fragments within the blades of the instrument has been laid aside, many cases which formerly would have been unfavourable for lithotrity are now successfully treated. The inability of the bladder to expel all the fragments was also considered a state in which lithotrity was not applicable. Yet now, after the stone has been well crushed, these cases can be managed by washing out the débris through a silver catheter. It may be well to mention that the eye of the catheter used for this purpose should always be on the concave side of the curve—for the reason, that if a fragment should chance to lodge in the aperture and not be removable, although on the withdrawal of the instrument the fragment might lacerate the urethra, the consequences that follow such an accident are of much less importance than if the lower part of the urethra were

injured. A catheter has lately been invented with the opening in the convex part—for the injecting the bladder—under the idea that the stream of water coming more immediately in contact with the fragments, their removal is more readily effected; which is rather a theoretical than a practical improvement, and the catheter has the disadvantage of having the aperture in the lower curve. There is no doubt that a healthy state of the bladder is very desirable when lithotrity is to be employed; but I have performed it with success when the bladder has been in a very considerable state of irritation and secreting much ropy mucus. This irritation and secretion of mucus diminish as the operations are performed, and nearly cease before the whole of the calculus has been removed. These cases certainly require much caution in their management, still they are by no means cases in which lithotrity is to be rejected. The inability of the bladder to hold the requisite quantity of water might at first deter a Surgeon from selecting such cases for the operation; but, on the other hand, a little management, by injecting the bladder for some time previous to operating, generally overcomes this obstacle, and not unfrequently, where a bladder has been very intolerant of water, this inconvenience has subsided after the stone has been once crushed. Where there is serious disease of the kidneys, lithotrity is no doubt as likely to be attended with ill consequences as lithotomy. But cases do occur where the presence of kidney disease would inevitably render lithotomy an unsuccessful operation, in which lithotrity may be employed, if not with entire success, with at least the alleviation of much suffering, and prolongation of life. The worst form of kidney disease, albuminuria, is fortunately not frequently found in combination with calculus in the bladder at the period of life at which it is desirable to perform lithotrity. In cases of very bad stricture of the urethra, rendering the introduction of the lithotrite impossible, lithotomy must be had recourse to; but in cases in which a considerable amount of stricture existed, I have been enabled, by using a small lithotrite, and crushing the stone very fine, to relieve the bladder of a considerable-sized stone. Malign-

nant disease of the bladder, in combination with calculus, of course precludes lithotrity as well as lithotomy.

The removal of foreign bodies that have been introduced into the bladder, such as bougies, may be effected with a scoop lithotrite.

In cases in which the bladder is unable entirely to empty itself, the urine left soon becomes decomposed and ammoniacal, irritating the mucous membrane, and causing it to secrete a quantity of phosphate of lime, or phosphate and carbonate of lime, which, being mixed with the mucus and retained in the bladder, gives rise to great irritability of that organ. In such cases the removal of this soft calculous matter is easily accomplished by means of the scoop-lithotrite. But the cause of the mischief remaining, these formations will constantly recur, and in some instances give rise to the opinion that the Surgeon had failed in the previous operation to remove the whole of the formations, which is not always the case. The treatment to be adopted to prevent the formation of calculous matter is the constant washing out of the bladder with warm water. These cases are usually very troublesome; and if this treatment is not persevered in, the disease of the bladder soon sets up disease of the kidney, under which the patient ultimately sinks.

Women are naturally, from the formation of the urinary passages, favourable cases for lithotrity; and the operation is to be performed in the manner that has been described previously for the other sex. The cure in women is less protracted than in men, as the fragments pass more readily. There are obvious reasons why it is desirable that women should be placed under the influence of chloroform. It may be said that with women, with hardly an exception, lithotrity is the method to be employed.

It is very generally admitted that children are not well fitted for lithotrity, and that lithotomy should in their cases be performed, not only on account of the great success attending that mode of operating at an early period of life, but also on account of the necessarily small size of the instruments to be used rendering it difficult to have them made of

sufficient power to crush stones of the size frequently found in children, and the almost impossibility of carrying out in them the continuous treatment necessary to bring lithotrity to successful issue.

The composition of the stone is not a matter of very considerable importance; perhaps those composed of oxalate of lime require more force in the application of the lithotrite, and the fragments cause more pain in passing than others; but this is fortunately a calculus not very frequently met with.

In comparing the relative successes of lithotrity and lithotomy, Sir Benjamin Brodie, in his 'Notes on Lithotrity,' makes the following remarks:

'It would be unreasonable to expect that any method of treatment for the relief of a disease so certainly fatal if left to itself, and productive of so much misery, as calculus of the bladder, should be constantly and uniformly successful. If lithotomy has its dangers, lithotrity has its dangers also; and the only question for the practical Surgeon to consider is, which is the least dangerous of the two. Of the nine cases which I have enumerated, it may well be doubted as to one of them whether the attack which was the immediate cause of the patient's death was really connected with the operation; while in two others the fatal result was to be attributed to a mode of performing the operation which my latter experience has led me to abandon. But, even if we admit the whole nine cases as a fair example of the average failure of the operation, the proportion of deaths to recoveries is somewhat less than 1 in $12\frac{1}{2}$.

'In order that I might compare this with the proportion of deaths from lithotomy, I have referred to a paper by the late Mr. R. Smith, of Bristol, published in the eleventh volume of the 'Transactions,' of this Society, and entitled 'An Inquiry into the Statistics of Stone in the Bladder;' and I there find it stated, that in the Bristol Hospital, during a series of many years, the average of deaths after lithotomy was 1 in $4\frac{1}{2}$; in the hospital at Leeds, 1 in 5; and in the hospital at Norwich, 1 in $7\frac{1}{4}$.

‘Thirty-five years have elapsed since the publication of these statements, but there is no reason to believe that the success of lithotomy is greater now than it was when Mr. Smith collected his observations. The editor of a weekly journal (the ‘Medical Times and Gazette’) has for some time past published the statistics of the various operations performed in the London hospitals, including lithotomy. The facts seem to have been collected with some care, and are probably a near approximation to the truth. Mr. Charles Hawkins has been at the pains to collect from the various numbers of that journal, published during the year 1854, the facts relating to lithotomy; and it appears that of 59 patients who underwent that operation, as many as ten died, being in the proportion of rather more than 1 in 6.

‘But here two other facts must not be overlooked, without which no just comparison can be made of the results of the two operations. First, while cases of vesical calculus in children under the age of puberty, in private practice, and among the more affluent classes of society, are of rare occurrence, they form the very great majority of those which are admitted into hospitals; and, secondly, the proportion of deaths after lithotomy among children is very much less than it is among adults. Both these facts are sufficiently obvious to those who have had the opportunity of witnessing the practice of our larger hospitals. From the data furnished by the medical journal to which I have already referred, it appears that in the London hospitals during the last year children formed a small fraction more than three-fourths of the whole number of those who underwent lithotomy; that among them the deaths were in the proportion of 1 to 14 recoveries; while among adults the deaths and recoveries were equal. That in this instance the large proportion of deaths among adults was beyond the average, and depending on accidental circumstances, cannot well be a matter of doubt, and indeed it is plain that no general rule can be drawn from the limited number of cases which occur in the space of a single year. Still, as even in the Norwich Hospital, where there is reason to believe that lithotomy has been on the

whole more successful than in any other public institution, the proportion of deaths among adults is reported to have been four times as large as that among children,* it is evident that the difference in the degree of danger at these two periods of life is very great; and it must always be borne in mind that, in estimating the comparative value of the two operations, it is only the results met with in adults that should enter into our calculation.'

There have not as yet been any very extensive statistics of lithotrity published. The latest are those of M. Civiale, of which Mr. Henry Thompson, in his work before referred to, says:

'Take, for example, the practice of my esteemed and kind friend, M. Civiale, during the last year. It is a fair specimen of his usual experience, which he is good enough to send me annually, and has of late presented to the Académie des Sciences. He treated, during the year 1862, 69 calculous patients—66 men, 2 women, and a child; 45 in private practice, 24 at Hôpital Neckar. Fifty-eight of these were operated on: 45 were submitted to lithotrity; of these, 8 were partially cured, and it was successful in all the remainder but 1.

'Ten were treated by lithotomy; 3 were cured, 2 relieved, and 5 died. Three were treated by a combination of lithotomy and lithotrity; 2 were cured, the other has incontinence of urine.

'In *eleven cases* operative means have been adjourned or considered impossible.

'Now, although the lithotrity here recorded is extremely successful, every English Surgeon will feel surprised to find one in every six adult cases placed in the category last named, and one half of the lithotomy cases fatal. It must be obvious to all who are familiar with the practice of this country, that nothing like this proportion of cases is adjudged unfit for operation.'

Mr. Thompson also states that Mr. Critchton has performed lithotrity in 122 cases with eight deaths.

* *Medico-Chirurgical Transactions*, vol. xi. p. 32.

It will be seen by the tables so carefully prepared by Mr. Thompson, that in 1827 cases of lithotomy, 1116 occurred in patients between the ages of one year and twenty-one years, leaving but 717 from that period up to the age of eighty-one; and of these, 462 cases occurred between fifty and eighty-one years, the period of life (at least in private practice) we are most called upon to operate for stone; and in these cases there were 115 deaths—about 1 in 4 cases. Now if we compare these statistics of lithotomy with those as yet given of lithotrity, it will, I think, leave no doubt in most minds which operation the Surgeon should prefer, at least in the large majority of adult patients.

One of the great advantages of lithotrity is, that patients are quite ready to submit to the operation when the stone is small, and when its presence has not given rise to any serious mischief in the bladder or kidneys; when, on the other hand, an operation so serious and so dreaded as lithotomy is driven off, as a last resource.

In reviewing all the bearings of the two operations, I think there is every reason to concur in the opinion expressed by Sir Benjamin Brodie: 'My own experience has certainly led me to the conclusion that lithotrity, *if prudently and carefully performed, with due attention to minute circumstances,* is liable to smaller objection than almost any other of the capital operations of surgery. The cases, indeed, to which it is not applicable are very few indeed, and they are chiefly those in which, from the calculus having attained an unusual size, the danger and difficulty of lithotomy are so great that no Surgeon would willingly, nor otherwise than as a matter of duty, undertake it.'

In conclusion, it may be well to consider how far it may be expedient, in arriving at a decision as to which of the operations should be adopted, to make some distinction between private and hospital patients. The greatest success attending lithotomy is undoubtedly met with in the latter class. These patients being willing to submit to an operation at an earlier period than those in private practice, are consequently in a more favourable state for lithotomy; and not being so amen-

able to the necessary treatment between the operations of lithotrity as the more educated classes (for lithotrity, although a simple operation in itself, requires, for a successful issue, great care and attention to the most minute points during the whole time the patient is under treatment), when the treatment becomes protracted, they are liable to become unfavourably influenced by hospital atmosphere. To hospital patients *time* is of much more importance than it is to the more affluent; so it may be considered more advisable to have recourse to lithotomy, on these accounts, in hospitals, when in private practice lithotrity would without doubt be the operation selected. Such at least may be the reasons why in hospitals lithotomy is as yet more frequently had recourse to in adult patients than lithotrity.

Being anxious to have accurate information as to the progress lithotrity was making in hospital practice in London, while these pages were going through the press, I applied for information on this point to all the London Hospitals, and was most obligingly and readily supplied with what I required from all, with the exception of the Hospital for Stone; the authorities of this hospital made no reply to my request. I must also state that the return from University College Hospital is not quite complete, as I failed to obtain any information from one of the Surgeons of that hospital. If the numbers reported from University College Hospital be compared with other hospitals of the same size, it will be seen that the number of cases unreported cannot be large. The absence of information from one Surgeon cannot in any great degree influence the result obtained by the subjoined table; from which it will be seen that out of 91 adult patients admitted, in two years, into the London Hospitals, with stone in the bladder, only 32 were treated by lithotrity: 6 underwent no operation.

*Patients with stone in the bladder admitted into the
London Hospitals in the years 1862-63.*

Hospitals	Total	Children	Adults	Lithotrity	Lithotomy
Guy's	31	15	16	7	24
St. Bartholomew's	25	16	9	3	22
King's College	22	7	15	9	13
London	17	5	12	2	15
University College	16	6	10	5	11
St. George's	13	2	11	3	8
St. Mary's	12	9	3	1	11
St. Thomas's	11	7	4	1	8
Royal Free	7	7	.	.	7
Middlesex	6	2	4	1	3
Westminster	5	3	2	.	5
Metropolitan Free	4	1	3	.	4
Charing Cross	3	2	1	.	3
Sick Children	3	3	.	.	3
Great Northern	2	1	1	.	2
	177	86	91	32	139

Since the above was originally printed I received a communication from Mr. Armstrong Todd, stating that my application to the Hospital for Stone had inadvertently remained unanswered. He was good enough to forward me the following return of patients admitted into the hospital during two years, with stone in the bladder:—The total number of patients admitted were 17, viz. children, 5; adults, 12. Lithotrity performed on 2; lithotomy on 7; not operated on, 8. This increases the number of adult patients with stone to 103, of which only 34 were lithotritised.

AN
ACCOUNT OF A CASE
OF
CALCULUS IN THE BLADDER

REMOVED BY LITHOTRITY,

IN WHICH A COMMUNICATION EXISTED BETWEEN
THE BLADDER AND INTESTINE,

FROM THE FORTY-FIRST VOLUME OF 'THE MEDICO-CHIRURGICAL TRANSACTIONS,'
PUBLISHED BY THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY OF LONDON.

BY

CHARLES HAWKINS,

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I HAVE ventured to bring the following case before the Royal Medical and Chirurgical Society because I believe it to be in some respects peculiar, and the operation having been followed by a successful result, it may induce those who may meet with similar cases to have recourse to the same means of giving relief. As far as I know, lithotritry has not been performed under like circumstances.

On July 14, 1857, Sir Benjamin Brodie and myself were consulted by a gentleman, aged 55, suffering from all the symptoms of stone in the bladder in a most aggravated form. He was much worn by a constant desire to pass water, accompanied with very great pain; the urine was alkaline, depositing much ropy mucus; his pulse was quick, and his appetite bad. His bladder was examined, and a stone readily detected.

The following history of his case is in his own words:

‘It was in February 1855, I first discovered a substance about two inches in length, which I had passed with my water; it had a most offensive smell. I said nothing about it, although I was passing it every day, because it gave me no pain or inconvenience, until June in the same year, when I showed some of the matter to my ordinary medical attendant, who would scarcely believe that it came with my water. He ordered me some medicine, which in no way diminished the quantity I passed. I consulted the same gentleman again in the following November, when he felt satisfied that what I passed with my water was fæcal matter, and he told me that there must be an opening from the bladder into the bowel; he gave me little hope of being able to give me any relief. During the year 1856, I ceased to pass any of the substance, but early in this year the symptoms of disease of the bladder set in, and continued with great severity during the whole year. In the beginning of the year 1857, I saw two other surgeons in consultation, when an instrument was passed into the urethra, and one into the rectum at the same time. I suffered much pain from this examination, and afterwards passed blood from the rectum. These gentleman came to the same conclusion as my own medical man, that an opening existed between the bladder and bowel; they both gave a most unfavourable opinion of my case, and thought that nothing could be done for my relief. It was not until I saw Sir B. Brodie and you, that stone in the bladder was detected.’

It was decided that, notwithstanding the history of my

case, an attempt should be made to remove the stone, as the patient was sinking from the mischief it was causing in the bladder. But his general health was so much impaired and the absence of continued sleep for now upwards of a year had rendered him so very nervous, that I thought it unwise to commence any operation until I had made an attempt to improve his state, and allay the irritability of his bladder. I advised him to return into the country, and to take some quinine and acid, and introduce into the rectum every night an opium suppository. He derived some benefit from this treatment, and the bladder-symptoms were a little abated. He returned to London on July 20; on the 25th, I performed the operation of lithotrity. The patient was anxious that he should be put under the influence of chloroform, and Dr. Snow administered it. I may state, in passing, that it is not my usual practice to have recourse to chloroform in lithotrity; I do so occasionally, on account of some special circumstances, but it is the exception, not the rule, in my practice. It is unnecessary to enter into my reasons for this on the present occasion, as I hope I may at some future period be permitted to bring before the Society my experience in this operation. The bladder held comfortably five or six ounces of water, a stone was readily seized, which was so large that the lithotrite could barely be opened sufficiently wide to grasp it; it was very soft, and gave way under the pressure of the finger. The patient bore the operation remarkably well, and soon began to pass fragments of triple phosphate; his bladder-symptoms were much relieved, and he continued to pass stone without any inconvenience till the 29th.

On the 31st, I again operated (Dr. Snow giving chloroform); the fragments continued to pass easily, and he now slept for upwards of an hour without being disturbed.

On August 5th, I repeated the operation, and at the patient's request, without chloroform. He had found on the previous occasions that it was a long time before he recovered from its effects, remaining in a confused and an uncomfortable state of feeling for upwards of twelve hours. The operation was borne quite as well as it had been when chloroform had been used; the bladder held more water. I was able to do

as much, and the patient complained of scarcely any pain, the fragments passed as easily as after the former operations, and all his symptoms continued to abate.

On the 12th, I operated again, with like success. On visiting him the next morning, I found him much depressed, with a quick and feeble pulse, cold skin, and some drowsiness. He had not been able to pass any water in the night, and unfortunately had not sent for me; but he said that early in the morning his bowels had acted, since which he had been easy. Upon examining what had been passed by the bowels, I found a large quantity of urine mixed with a considerable quantity of blood: it was evident that some obstruction to the passage of the urine by the natural way had occurred that could not be overcome, and that the bladder had given way, I concluded, where the old opening had existed. I prescribed astringents, and ordered lumps of ice to be introduced into the rectum, and confined his diet to cold drinks. Mr. Cæsar Hawkins, who met me in consultation on this day, concurred in this treatment; it was continued for two or three days. Neither at this time, nor at any other when I examined the rectum with the finger, could I detect any opening into the bladder. For about twenty-four hours all the urine came by the rectum, it was then passed by the urethra, untinged with blood: and in forty-eight hours no blood was passed by the rectum. In four or five days he was quite as well as he was before the last operation, but he continued to pass some urine through the rectum.

Not considering it advisable to continue any operative proceedings at this time, he left London on the 20th, without any further examination of the bladder being made; his general health had much improved and the bladder-symptoms abated. I prescribed decoction of *pareira brava* and *hyoseyamus*.

The symptoms of stone however continuing, he returned to London on October 5. On the 7th, I examined the bladder, which held six ounces of water well; stone was readily detected, which I crushed; he bore the operation remarkably well. On the 21st all the symptoms of stone were gone. I examined the bladder, and could not detect any; he was

anxious to return home on business, and left London the next day. Towards the end of the year the symptoms of stone returned. On January 25, 1858, he came to London again in excellent general health, but with unmistakable symptoms of stone in the bladder.

On the 27th, I examined the bladder, at once seized a stone, and crushed it. From the fragments he passed I believed it to be a new formation.

On the 30th, I repeated the operation.

On February 2nd, I examined the bladder, and could not detect any stone. The urine was quite healthy. He neither suffered pain nor inconvenience, slept nearly all night, and the next day he left London with directions to pass a gum catheter, and to well wash out the bladder with warm water daily, so as to prevent, if possible, fæcal matter lodging in the bladder, and again forming a nucleus for stone, as he had been passing fæcal matter with his water, from time to time, for the last three months, and on the last two occasions of my operating, fæcal matter passed through the catheter when I injected the bladder. I had given him the same directions when he left London before, but circumstances had prevented his following them, hence the new formation of stone.

Since his return home the patient has remained perfectly well. A few days ago I received the following note from him:

‘I am very happy in being able to inform you that I continue quite well; free from all pain. I am better than I have been for years. I pass my water very freely. I use the instrument every night. I have discovered once a considerable quantity of fæces; once a small quantity; but at other times my water has been quite clear; never any blood.’ He ends his note with this laudable expression of gratitude for what surgery has done for him: ‘when I am dead, if my bladder or any other portion of my body will be of any use for the benefit of my fellow-creatures, it is at your service.’

It is difficult to give an idea by weight of the size of

the stone removed, as it consisted entirely of triple phosphate; but if all the detritus had been collected it would have filled a three or four ounce bottle. Dr. John Ogle, of St. George's Hospital, who kindly examined it for me, gives the following account of it: 'It was formed of the triple phosphate, having as a nucleus a number of little foliaceous-looking masses, of about one-eighth to one-fourth of an inch in size; after the addition of a little acid they were quite obviously seen to be vegetable in character, presenting numbers of vegetable cells in a good state of preservation.'

From the foregoing history it is evident that at some period ulceration must have taken place in the bladder or bowel, most likely, in the first instance, in the latter, resulting in the communication, which existed previous to the symptoms of stone showing themselves; and as no fæcal matter passed with the urine for upwards of a year previous to the operation, it may be concluded that the opening had closed, and continued so until the occasion of the retention of urine, in the night of August 12th, when it was again opened.

It is not a little singular that so much mischief should have taken place, resulting in a communication between the bladder and intestine, occasioning so little inconvenience to the patient, for until he perceived the fæcal matter in his urine he experienced no inconvenience of any kind with reference to those parts.

Notwithstanding all that had taken place, and the very great irritability of the bladder that existed in this case, and I scarcely ever saw greater suffering, I never had a patient that was so little distressed by the operation, or passed through all its stages more satisfactorily, until the unfortunate occurrence of the 13th of August: and it is surprising that after the communication with the bowel again existed, the bladder was still able to retain between six and eight ounces of water, and bear without any ill effect the presence of the instrument, and the manipulations necessary for seizing and crushing the stone.

THE SEQUEL OF A CASE

IN WHICH A COMMUNICATION EXISTED BETWEEN
THE BLADDER AND INTESTINE,

FROM THE FORTY-SECOND VOLUME OF 'THE MEDICO-CHIRURGICAL TRANSACTIONS,'
PUBLISHED BY THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY OF LONDON.

BY

CHARLES HAWKINS.

IN the last volume of 'The Transactions' of the Society there is an account of a case, in which a communication existed between the bladder and intestine, where a calculus had formed in the bladder, which I removed by lithotrity.

The patient having since died, I have thought that the following account of what was found at a post-mortem examination, might prove of sufficient interest to occupy the attention of the Society for a short time.

On February 2, 1858, the patient was reported to be quite free from calculus in the bladder; and there were no symptoms of stone from this time to that of his death, which took place on April 19, 1859.

He continued to pass fæcal matter occasionally with his urine, and until within a few weeks of his death he daily washed out his bladder with warm water, by means of a syringe and catheter. About three or four months previous to his death his general health gave way; his digestive organs became impaired, accompanied with considerable irritability, and some mental disturbance; the symptoms exhibited previous to his death did not appear to depend upon the disease of the bladder or intestine.

Mr. Shield, of Hungerford, under whose care he was latterly, examined the body after death, and was good enough to send me an account of what he found, and also the bladder, and the portion of the intestine implicated in the disease, which are now in St. George's Hospital Museum. The following are the appearances they presented.

There was an opening in the bladder at the lower part of the posterior wall, of the diameter of a goose-quill, evidently not of recent date; the bladder corresponding to this aperture was intimately united by old adhesions to that part of the circumference of the sigmoid flexure of the colon that lies nearest to it. The aperture in the bladder communicated with the sigmoid flexure opposite their point of union. Above the point of communication of these two viscera, for the extent of about an inch, the canal of the sigmoid flexure was somewhat constricted; but this constriction was apparently due to the adhesion and subsequent contraction of these viscera, as beyond the point where the adhesion between them existed, the caliber of the sigmoid flexure appeared normal. Below the communication between the bladder and colon, the canal of the intestine was greatly constricted, to the extent of an inch and a half in length, admitting a tube through it of the size of the little finger. This stricture appeared to depend upon great condensation and subsequent cicatrization of the submucous and muscular tissues at that point. The mucous membrane of the intestine, above the seat of stricture, presented in many places pouches, varying in size from that of a pea to that of a filbert, and formed by protrusion of this coat externally. Opposite to the stricture it appeared to be healthy, but very densely convoluted. The rectum was very much dilated, and had, during life, evidently acted as a second bladder, as from the symptoms described by the patient, the urine used to accumulate there, and was discharged in considerable quantities per anum. The bladder was healthy, and did not contain any calculous matter. The kidneys were somewhat congested, but otherwise were in a normal condition.

The appearances described bear out the opinion I gave in my former paper.

The history of this case is a good example of the great value of lithotrity in the treatment of calculus in the bladder in complicated cases. I was enabled, by this operation, entirely to remove the stone, and relieve the patient of great suffering; and I think, considering the state of parts revealed by the post-mortem examination, that, had lithotomy been resorted to, it would not have been followed by the same amount of success.

Mr. Sydney Jones, in December last, exhibited at the Pathological Society a specimen very similar to that I have described, and where a calculus was formed in the bladder, with fæcal matter as a nucleus; but no attempts appear to have been made to remove it, extravasation being the immediate cause of death. Mr. Jones observes—‘The cause of death was the existence of calculus in the bladder. Had not this impediment to the escape of urine from the bladder been caused by the presence of this calculus, it is probable that the case would not have had so speedy a termination.’

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