A CLINICAL LECTURE ON STONE IN THE BLADDER.

Delivered in University College Hospital on May 13th, 1895,

By CHRISTOPHER HEATH,

President of the Royal College of Surgeons of England.

GENTLEMEN,—On May 8th you saw me remove these three stones from the bladder of a patient aged 45. He was admitted into the hospital from the Out-patient Department, where he presented himself complaining of pain about the bladder and trouble generally of the urinary organs; and from the symptoms he gave Mr. Drew thought it right to examine his bladder, and, on sounding, immediately detected the presence of a stone, and sent him into the ward. I proceeded to examine his bladder with a sound; and I then, without difficulty, detected a good-sized stone. Under these conditions, and, taking into consideration the fact that his urine was only slightly acid and that it was very cloudy, with a good deal of bladder irritation, I decided on performing a suprapubic lithotomy rather than lithotripsy. That operation I did on May 8th quite successfully; and you have just seen the man—five days later—lying in bed perfectly well and practically cured. All I have done to-day is to remove the tube which was introduced at the time of the operation.

THE SYMPTOMS OF STONE.

With regard to the symptoms of stone you must remember that we constantly have patients coming here who think they have stone and who have not. You will recollect that only a week ago I sounded a man who was sent here under the impression that he was suffering from stone in the bladder, and you must remember that everyone, I do not care who it is, occasionally makes a mistake in overlooking a stone. It is just as well, however, not to be too cocksure about the business, and decide as to the absence of a stone on one examination only; and I therefore told that patient to come again, that I might examine him under chloroform, so as to make quite sure.

Now the symptoms of stone are these: You find in the first place that the patient has increased frequency of micturition, and further that the frequency is more noticeable by day than during the night, which is just the reverse of what occurs in a patient with an enlarged prostate. A prostatic case is always worse at night, and gets completely worn out by his rest being broken through constantly getting up during the night; while on the other hand a stone case, once in bed and at rest gets quite comfortable and his pain leaves him, but if he has to be about in the daytime, and especially if he has to go through any violent exertion, the pain naturally comes on severely.

A man suffering from stone in the bladder becomes very artful. He will tell you that he can ride in a tram without any inconvenience but that he cannot manage an omnibus; obviously the tram being smoother in its motion makes all the difference. He knows, too, from experience that he has more pain when he empties his bladder, the reason being, of course, that the empty bladder comes in contact with the calculus, and thus pain is produced, which is referred very generally to the end of the penis. In children that is very marked, and you see that a child will pull at its penis, and sometimes elongate the foreskin very considerably from the irritation arising from a stone; and you will find every now and then that a child is circumcised under the impression that it is suffering from an elongated foreskin, while it really has stone in the bladder.

After that the next most important symptom is the occasional passage of blood. The patient passes every now and then a little blood, and more particularly after any exertion. Your patient will recognise this relation of blood to exertion, and, if a hunting man, will say that he notices if he has

had a hard run that the bleeding is worse than when he has had a quiet day.

THE DETECTION OF STONE BY SOUNDING.

If you have, then, these symptoms—increased frequency of micturition, pain after emptying the bladder, pain at the end of the penis, and occasional passage of blood—you will conclude that the patient probably has a stone, and you will be quite justified in sounding that patient; and you will have no difficulty in touching the stone if it is anything of a size.

Now, you may remember a case in No. 1 Ward sent up to me last winter by a medical man, who said he thought the patient had stone in the bladder. I sounded him in the ward and could not find any stone; still, following the rule to sound a second time under chloroform, I had him brought into the theatre and sounded him with a lithotrite, and found, rather to my surprise, that the lithotrite had caught a small stone, which I at once crushed and extracted. It was so small that I had failed to detect it with a sound; but when the stone is of any size, such as these three, you can have but little difficulty unless there is an enlarged prostate. And then there comes in this fallacy: The surgeon, in the case of an enlarged prostate, may not push the sound completely into the bladder. He uses the sound in the usual fashion, rotating it in the prostatic urethra, and may easily fancy that there is no stone present; but if he pushed the sound well up into the bladder he would find the stone. You should make sure, therefore, that you have pushed the sound well up into the bladder, and directly the sound has entered turn it down and explore behind the prostate. Then comes the question, Shall you or shall you not have some water in the bladder? Well, you ought to have some, and I take it that whatever is in the bladder at the time will probably be enough, but if you fail to detect the stone there may be more water than you want, so it is convenient to use a hollow sound to enable you to draw the water off, and as you do so you may feel the stone click against the sound. It is possible, of course, to make a mistake. It has happened that growths in the bladder, which are coated with phosphates, have been mistaken for stone. It is said, too, that in the case of children mistakes may arise through the sound striking the pelvis. In this particular case there was no question at all. Here was man of 45 years of age with a large stone in his bladder, and I therefore resolved to do the suprapubic operation.

THE SUPRAPUBIC OPERATION.

This operation is a revival of a very old proceeding, an operation which was done, so far as we can tell, about the year 1560 by a French surgeon, Pierre Franco, and it appears to have arisen in this way: He was going to remove a stone by the perineal operation, but found that it was so large that he could not do so; and then he found that the stone could be easily pushed up above the pubes, and accordingly he cut down upon it there and took it out without difficulty, and the patient did perfectly well.

Cheselden, who was a great lithotomist in this country about the year 1700, and whose bust you may see at St. Thomas's Hospital, and whose portrait, when you are fortunate enough to get your diploma, you will see in the Council Room at the College of Surgeons, took up the operation, and then seems to have abandoned it in favour of the lateral perineal operation. Although the operation of suprapubic lithotomy was occasionally performed after its first introduction, for the last 250 years the operation has practically been disused. What brought it into notice again was this: that a British anatomist, Dr. Garson, drew attention in the *Edinburgh Medical Journal* for October, 1878, to the effect on the bladder of distending the rectum.

Here is Dr. Garson's diagram of a frozen section of the bladder and rectum in their natural positions, and in this other diagram is shown the effect of the distension of both viscera: the front of the bladder is in contact with the anterior wall of the abdomen, and you will notice that the space between the peritoneum and the top of the pubes is about $1\frac{1}{2}$ inch, which would be quite sufficient to allow of a suprapubic lithotomy.

This paper did not attract much attention among surgeons, but, two years afterwards, in 1880, Petersen, a Danish surgeon, of Kiel, quite independently promulgated the notion

that if you distended the rectum, and at the same time the bladder, you would get the effect which Dr. Garson had already pointed out. So Petersen invented the rectal bag, which is a sausage-shaped or conical india-rubber ball, which is introduced into the rectum and distended with fluid, and the bladder, being also filled, is raised, and the peritoneum is pushed up out of the way. This plan gave a great impetus to the operation, and it has been very generally employed since in this country and in other countries, and with very great success. But you may have noticed that I did not use Petersen's bag, and that I did not distend the bladder with water, but that I preferred distension with air. It is the first time I have done it, and I think it is an extremely good plan. The suggestion was made by Bristowe, of Brooklyn, to Dr. Keen, of Philadelphia, who was, I believe, the first to employ air. You saw that I put a catheter into the urethra, and, having first washed out the bladder as a precautionary measure, I then emptied the bladder again and distended it with air, and purposely left the catheter still in so that I could put more air in if necessary, and also that I might use the catheter to raise the apex of the bladder if I wanted to do so. Having felt that the bladder was fairly well distended, I made an incision immediately above and on to the pubes about 2½ inches in length. I then worked in carefully between the muscles, and having exposed the fat and cellular tissue I came on the bladder with my finger, and then, in order to keep it within

this advantage of the air over the water distension, that the air escapes easily and there is no mess. There is also another consideration: if there is a sudden rush of water it may wash out with it a small calculus, which may get lost. Now this actually occurred to an eminent surgeon, a friend of mine, who in the presence of a large class opened a bladder for stone and no stone could be found. My friend was quite sure that he had felt the stone but he could not find it, and he went away in great dudgeon; but the stone was found afterwards in the blanket of the patient, having been washed out in the rush of water.

THE NECESSITY OF SOUNDING IMMEDIATELY BEFORE OPERATION.

Here let me say that no one, however eminent he may be, is justified in cutting into a bladder for stone under any circumstances whatever without first sounding the patient at the time of the operation. It is one of the rules of surgery, which ought never to be forgotten, that you are bound to sound the patient on the table. It is not sufficient to have sounded the patient the day before; it must be done at the moment of the operation. It occurred once to Liston, here in this theatre, on sounding a child's bladder not to find a stone; he sent the child away to bed, and again sounded him the following week, and found a stone easily and removed it, and I give you that as an example of what ought to be done. I have known a surgeon cut into a bladder for stone, being contented with some-body else having some days before sounded the patient, and in that particular case there was no stone in the bladder.

Fig. 1.—Longitudinal section through a frozen body with the rectum much distended (artificially). 1. Peritoneal fold passing over the bladder from the abdominal walls. 2. The bladder. 3. Internal orifice of urethra. 4. The prostate. 5. Dorsal vein of penis. 6. Bulbous portion of urethra. 7. Cowper's glands. 8. The upper end of the membranous portion of the urethra. 9. Peritoneal fold forming Douglas's pouch. 10. Prostate. 11. Abscess in the bulbous portion of urethra.

reach, I passed two threads with a curved needle, one on each side, to hold the bladder in position; next I scraped a little on to the muscular fibres of the bladder, taking care to avoid some veins, and for this I used a little ivory instrument, which was a suggestion of Sir Henry Thompson's. I was then able to open the bladder in the middle line without any difficulty, and the air immediately escaped. There is

Fig. 2.—Longitudinal section through a frozen body with the rectum filled (naturally), but not distended. 1. Peritoneal fold passing over the bladder from the abdominal walls. 2. The bladder. 3. Internal orifice of urethra. 4. The prostate. 5. Dorsal vein of penis. 6. Bulbous portion of urethra. 7. Cowper's glands. 8. The upper end of the membranous portion of the urethra. 9. Peritoneal fold forming Douglas's pouch. 10. Prostate. 11. Abscess in the bulbous portion of urethra.

AFTER-TREATMENT.

In regard to the after-treatment I have but little to say. We put in a flanged india rubber tube, and we fastened a sheet of oil-silk beneath the flange and attached it to the pubes with plaster. The man has been lying perfectly dry and comfortable in bed, the urine being soaked up by mess pads, and to-day we have removed the tube, and in another week or so the opening will be closed up. The patient was

relieved from all pain, and has eaten and slept well from the first.

DETAILS OF THE OPERATION.

Then with regard to the mechanical part of the operation. In the first place, you may have noticed that I stood, as I always do, on the patient's right hand. It is much more convenient when you sound a patient to stand on the right; taking the sound in your left hand to pass it along the urethra, and then into your right hand to enter the bladder and sound. That is what I did with the silver catheter which I used as a sound; then, still standing on the right side, I made my incision from above downwards, and I found no difficulty in slipping over my finger a pair of slightly curved forceps, and picking out the three calculi one after the other. The largest weighs 247 grains, the next 93 grains, and the smallest 36 grains, or a total of 376 grains. Now it is not always quite so easy to pick stones out of a bladder, for you may have to deal with a very rough calculus, a mulberry stone, which may be partially adherent to the coats of the bladder, or again you might have a stone which has become encysted, that is to say, where the stone is in a pouch from which you have to dislodge it with a scoop. Or it may happen to you, as it did to me once, to have so large a stone to remove as to make it difficult to take it away. Here is the stone, which weighs nearly 11 ounces, and that stone I took out of the bladder of a patient in the year 1890—on a Sunday I remember, and I never had such a sultry Sunday afternoon's work in my life.

The remarkable thing about the case was that the patient had suffered from urinary symptoms all his life, and the medical man who called me in had brought him into the world. The patient had always been a weakly lad and troubled with his waterworks, and yet for over thirty years, with these symptoms continually present, the patient had never been sounded. The probability is that the stone was there very early in the patient's life—possibly at birth even, for such a thing no doubt does occur. Immediately after the operation the patient did fairly well; but he only lived for three weeks, gradually sinking, worn out with kidney disease.

So much then for the operation of suprapubic lithotomy, which I must say is an exceedingly easy one if properly done; but it is possible to make mistakes in it as in any other operation. I have myself seen the peritoneum opened in this operation, and it is naturally a thing to avoid. It is well to remember that you should always endeavour to have the bladder in as healthy a state as possible, so that if the peritoneum is opened as little harm may follow as possible. In the case I mention the peritoneum was opened and the bowels were exposed, but it was carefully washed out and then stitched up, and no harm came; still it is a very great point not to open the peritoneum.

CHANGES IN THE METHOD OF TREATING STONE.

Now just a word with regard to the changes which have taken place of late years in the treatment of stone. You are most of you probably aware that this theatre was the place where the great Robert Liston did most of his operations from 1836 to 1847, when he died; and it was crowded week after week by students and practitioners anxious to see Liston operate. I suppose he was one of the greatest lithotomists that ever lived; he had a very large number of cases of lithotomy and enjoyed very great success. The operation he performed was the lateral operation, and being a very powerful man, he cut boldly into the bladder and then with a large pair of forceps he grasped the stone and somewhat roughly drew it out. You must remember that the great bulk of his operations were done before the days of anaesthetics, when rapidity was a very great point. The patient was held by force in the lithotomy position, and the surgeon was naturally anxious to be as rapid as possible and thus save prolonged suffering.

Let me say *apropos*, that I think it is much to be regretted that Mr. Pepys, who wrote *Pepys's Diary*—and I presume you all are acquainted with that classic—was not keeping his diary at the time he was cut for stone, about the year 1660. He alludes to the fact indeed very often, but he did not begin his diary till two years after he was cut. It would have

been extremely interesting if a man like Pepys, who could so accurately describe even the smallest detail of his domestic life, had been able to give us his account of what he felt during the operation of lithotomy.

After Liston's death, when anaesthetics came more into vogue, of course rapidity was not so much sought after; and Sir William Fergusson, who was perhaps the next greatest lithotomist, was more deliberate. He was equally successful, but was more deliberate, and he made freer incisions into the neck of the bladder. That was at King's College Hospital; and when I was a student there, week after week lithotomy was performed with a large amount of success, especially considering the dangers that the patients then incurred from septic complications.

After Liston's time, of course, we had here Sir John Erichsen, who was also an excellent lithotomist, and then Sir Henry Thompson, who, I suppose, is the greatest living authority on stone. He devoted his attention to lithotritry, and I have seen him do four and five cases in one afternoon with remarkable success. He so much preferred lithotritry that he seldom did lithotomy, except under special circumstances. All these lithotomy cases were perineal, lateral or median operations, and a suprapubic operation was only performed under very exceptional circumstances. But practically nothing else has been done here since the operation was brought into vogue by Petersen, and I know that Sir Henry Thompson has had a large success with the suprapubic method in private.

You can hardly go wrong in a suprapubic operation as you can in the perineal operation, and there have in former years been in this city and in other large cities melancholy cases of mismanagement of perineal lithotomies. I have myself seen one or two tragedies of the kind. I was assistant surgeon at another hospital to a surgeon who came, so to speak, a "cropper" with his first lithotomy on a child. The result was that he never would do another case, to my very great advantage, because I had all the lithotomies, and did a large number of operations in both children and adults. They were all, of course, perineal lithotomies. I have done a fair number here too, but of late, following the lead of others, I have adopted the suprapubic method when the stone is too large to remove comfortably with the lithotrite.

In doing a suprapubic lithotomy you are entirely independent of an assistant, you only require ordinary help; but if you cut into the bladder from the perineum you require a skilled assistant to hold the staff, and the result of want of proper skill on the part of the assistant may react on the principal, and not only may mischief be done to him, but a catastrophe may happen to the patient. On the other hand, a principal may attribute his mishap to an assistant unfairly, as happened once to myself.

I do not want to trouble you with the details of perineal lithotomy, because you will probably never see it done. The suprapubic method seems so thoroughly to have established itself among surgeons that one may reasonably look forward to its being the operation in the future.

The fifth International Congress of Otolology will be held in Florence under the presidency of Professor Grazioli from September 23rd to the 26th. The following are the subjects selected for general discussion: 1, the Treatment of Intracranial Abscesses consequent on purulent diseases of the ear, introduced by Dr. Thomas Barr, of Glasgow; 2, General Treatment in Diseases of the Ear, introduced by Dr. Gellé, of Paris; 3, General Treatment of Diseases of the Internal Ear, introduced by Professor Gradenigo, of Turin; 4, The Present State of our Knowledge of the Pathology of the Labyrinth, introduced by Professor Politzer, of Vienna; 5, On the Physiology of the Middle Ear, introduced by Dr. Charles Secchi, of Bologna. All members of the profession who intend contributing papers or being present at the Congress are requested to communicate with the Secretary not later than June 15th. Early in July each intending *congressista* will receive a detailed programme of the meeting. The official languages are Italian, French, German, and English. The subscription, which includes a copy of the printed Transactions of the Congress, is 20 francs. The Secretary-Treasurer is Dr. T. Bobone, of San Remo.