ON SOME
DANGERS CONNECTED WITH THE USE OF
THE ASPIRATOR

AS A MEANS OF
RELIEVING THE DISTENDED URINARY BLADDER,
WITH SUGGESTIONS FOR THE TREATMENT OF CERTAIN
CASES OF RETENTION OF URINE.

BY
WILLIAM H. BENNETT, F.R.C.S.,
ASSISTANT SURGEON TO ST. GEORGE'S HOSPITAL, AND LECTURER ON
ANATOMY IN THE MEDICAL SCHOOL.

Received December 14th, 1886—Read February 22nd, 1887.

THE operation of aspirating the bladder, by means of a fine needle introduced above the pubes, for the immediate temporary relief of retention of urine, has become a common proceeding on account of its simplicity and supposed harmlessness.

It is recommended by the majority of the accredited authorities in the text-books of the day, and is variously spoken of as being "safe," "perfectly safe," "entailing no danger," "simple and admirable," &c. In one authority only can I find any caution as to possible danger from urinary extravasation, and that applies to the

proceeding when repeated, being associated with a reference to the fatal case recorded by Dr. Mackie Williams in the 'British Medical Journal' for February 21st, 1880.

Personally I have long thought, and indeed have been in the habit of teaching, that the operation, trivial as it may appear in itself to be, is open to serious objections, and may be connected with grave risk, for it has always seemed to me that the production of a distinct breach of surface in the walls of a distended bladder, by the introduction of a needle, however fine, the organ being one of great elasticity and muscular power, would directly tend to a giving way of the coats at the point of puncture, *unless an immediate and decided relief of tension could be effected by a free and rapid flow of urine from the needle*, and that even if no actual rupture were to occur there may be a liability under similar circumstances to an oozing of urine through the wound by the side of the instrument.

This liability would be increased by the spasmodic contraction which the act of puncture would probably excite in the bladder walls.

In aspiration by means of a fine needle, this immediate relief of tension does not, in my opinion, appear to be sufficiently decided to obviate the risks alluded to, since the flow of urine is of necessity slight, seeing that the canal of the needle is of so small a size.

Herein there lies, I believe, a strong objection to the operation in many cases.

With reference to the question of vesical tension, I may perhaps say that I have been for some time watching with considerable care the immediate effect upon the contraction of the bladder coats, produced by the introduction of instruments *per urethram* as well as through the walls of the viscus, and, so far as I am able to judge, the following conclusion, based partly on the sensations of intelligent patients, and partly upon careful observation of the force of the expelled stream of urine, may be taken as fairly accurate.

The introduction of a catheter or canula into a bladder

distended to any extent short of that which would cause a temporary paralysis is followed immediately by a jet of urine, through the instrument, the force of which is determined by the degree of elastic tension in the organ. After an interval, momentary in itself, the stream becomes much stronger from violent spasmodic contraction of the muscular elements of the vesical walls, aided by the action of the abdominal muscles, which, under these circumstances, are, as a rule, beyond the control of the patient.

It follows, therefore, I assume, that the period of greatest tension is not at the moment of the entry of the instrument, but shortly afterwards ; *unless the bladder is enabled to empty itself very rapidly*. It is at this moment that the liability to rupture or oozing is the greatest, and then must be the time at which a free flow is most called for, such a flow as would be provided by the use of the ordinary trocar and canula usually hitherto employed for tapping the bladder through the rectum or above the pubes as the case may be.

I may at once state that I believe the aspirator may be used without risk of rupture or exudation for cases in which the bladder coats are *healthy*, as they may of course be in a case of recent acute retention, but in cases of old-standing obstruction, whether from stricture or prostatic enlargement, where the bladder walls are hypertrophied, varying in thickness, and often rotten or easily lacerable, the proceeding may be productive of serious harm, and is altogether inferior to the older method of tapping with the large trocar and canula.

An objection of a minor kind to the use of the aspirator seems to me to present itself in those cases in which the bladder contains putrid urine, for it must surely be a proceeding of doubtful advisability to withdraw, through the perivesical cellular tissue, a needle which has been directly before steeped in a decomposing and virulent fluid.

Whatever value may be attached to the foregoing remarks, the following case will sufficiently demonstrate the serious complications which may follow the simple

proceeding of aspiration of the bladder under certain circumstances.

J. P—, æt. 38, a shopkeeper, a steady and intelligent man, was admitted into St. George's Hospital under my care on September 19th, 1886, with the following history.

Sixteen years previously, whilst he was the subject of a urethral discharge, he had been thrown violently across a horse's withers whilst riding. Immediately afterwards some blood came from the urethra, and the stream of urine commenced to diminish gradually in size. In three months he could urinate only with great difficulty, and therefore went to St. Bartholomew's Hospital as an in-patient, where a catheter was passed and tied in; ultimately he was made an out-patient, after having been instructed to pass a catheter for himself.

In a few weeks he neglected to use the instrument, and again the stream became very small, and for years before his present illness he had been unable to micturate without much straining and frequent pain.

Three days before he came under my treatment complete retention supervened. Twelve hours later the urine began to dribble away, and had continued to do so up to the time of his admission into the hospital.

He had applied at another hospital on the previous day, where catheterisation had been attempted without success, and had been followed by copious bleeding.

On admission.—The patient was in great pain and distress. Urine was dribbling from the urethra, the bladder was much distended.

The house surgeon, having failed to pass a catheter, introduced an aspirator needle into the bladder above the pubes, but drew off only a small quantity of foul urine which contained no blood.

Immediately after the introduction of the needle the patient was seized with acute pain, and commenced to vomit. I was accordingly sent for at once, and on my arrival found the man vomiting and rather collapsed; there was dulness above the pubes, some rigidity about

the abdominal parietes in the hypogastric region, and tenderness on slight pressure.

Without very much difficulty I passed a No. 4 catheter (silver) through a hard stricture into the bladder, and drew off a small quantity of urine, which contained a considerable amount of blood. The dulness and rigidity above the pubes were very little, if at all altered, by my proceeding, but the patient was so well satisfied with the fact that a catheter was in the bladder that he declined to have anything further done. The instrument was therefore loosely tied in.

On the following morning, September 20th, he thought himself rather better; the pulse was very quick, the tongue rather dry, the temperature normal, there was occasional vomiting. Only a little bloody urine had passed through the catheter.

The dulness above the pubes was rather more extensive, but the rigidity seemed slightly less marked.

The catheter was withdrawn, and a No. 6 passed without difficulty, but the patient begged that it might not be tied in, as he ascribed the vomiting to the presence of the instrument in the bladder. It was therefore ordered to be passed at frequent intervals.

By the 21st only a few ounces of urine had been drawn off by the catheter; the patient was worse in all respects. The dulness had much increased, there was great tenderness over the hypogastrium, but he still declined further interference. On the 22nd he was obviously sinking, and I at length obtained permission to deal with the case as I thought fit. I therefore cut down in the middle line immediately above the pubes, sixty-four hours after my first seeing the patient. Upon getting through the parietes a large quantity of dark-coloured, intensely ammoniacal urine rushed out through the incision. On introducing the finger, a large cavity could be felt with a softish mass at the bottom, which was presumed to be the bladder; the walls of the space appeared to consist of a quantity of sloughing cellular tissue. The cavity was

thoroughly washed out, and a large drainage tube inserted.

So much relief followed the operation that the patient immediately rallied, and by the 25th was in a fairly satisfactory condition.

The vomiting ceased, the rigidity about the abdomen gradually subsided, the pulse improved, and nourishment was taken well, but in spite of the persistent use of the catheter, all the urine passed through the abdominal wound, which was full of sloughing tissue.

On September 30th, therefore, I performed a median cystotomy, introduced a large tube through the wound, and tied it in.

By October 4th great improvement had taken place, very little urine was coming from the hypogastric wound, at the bottom of which there still remained a large flabby slough.

On October 8th this slough came away, and was followed by a considerable flow of urine. This fact, combined with the appearance of the slough, seemed to indicate pretty certainly that a portion of the bladder itself had become gangrenous. After this date, although there was a continuous full flow of water from the peritoneal tube, a considerable stream constantly came from the hypogastric wound. That which came through the perinæum was clear, contained a little blood at times only, and showed but a small quantity of albumen.

Upon the evening of October 13th some swelling of the right leg was noticed, and upon examination the ilio-femoral vein was found to be blocked. There was very little pain, but the pulse was quick, and the temperature, which had up to this date varied from 98° to 100°, now rose to 102°.

The thrombus soon commenced to clear up, and the swelling of the limb gradually subsided. The general condition of the patient suffered seriously from this complication, and great weakness followed, which was much increased by the extreme disinclination of the patient to take food of any kind.

By October 20th all the slough seemed to have come away, the urine was still passing freely by both wounds, and the strength was being regained as more nourishment was taken.

No great change occurred, although there was some improvement in the general health and a steady decrease in the quantity of urine which came from the supra-pubic wound, until November 4th, when a fluctuating swelling was observed in the left groin. On the 6th there was a distinct change for the worse, the abdominal wound was very foul, and a considerable quantity of fæcal matter was seen to come from it. From this date the case became hopeless, the fæcal discharge increased in quantity, and all nourishment was refused. He gradually sank and died on the 9th.

Post-mortem examination.—The bladder, contracted to the size of a small hen's egg, lay, denuded of peritoneum, in a cavity below and behind the pubes into which the hypogastric wound directly led. On the anterior aspect of the viscus was a circular orifice rather larger than a shilling, the result of the rupture and sloughing referred to in the notes of the case. The opening from the neck of the bladder into the urethra was patulous and gaping from having lodged the perinæal tube for so long a time.

The cavity in which the bladder lay was bounded above and behind by coils of large and small intestine matted together. In a knuckle of the latter, which projected somewhat into the space, were two openings, with sloughy margins, from which fæcal matter freely oozed.

There was no evidence of peritonitis, old or recent, excepting in the immediate neighbourhood of the walls of the cavity, nor was there any obvious obstruction caused by the matting together of the intestinal coils.

On dividing the ureters a little pus exuded from that on the left side. The kidneys were in a condition typical of chronic suppuration in an early stage.

The occurrence of this case recalled to my mind one of a less serious kind, having some bearing on the question

of the use of the aspirator, which came under my notice in 1875, when I was house surgeon to St. George's Hospital, and of which I have some brief notes.

A man, æt. 65, applied for treatment on account of retention of urine due to enlarged prostate. Having failed to introduce a catheter, and as he declined to become an in-patient, I aspirated the bladder above the pubes and drew off a large quantity of foul urine.

The patient complained of a good deal of pain at the time of the withdrawal of the fluid, and it struck me that there was rigidity about the seat of the puncture directly afterwards.

He came again on the following day, having succeeded in the meantime in introducing his catheter into the bladder, as he had been for some time accustomed to do. There was then distinct tenderness and rigidity above the pubes, but not much pain. Three days later he again presented himself, having suffered a good deal of pain since his last visit. He had also noticed on the previous day some pain and tenderness about the back of his perinæum, where I found on one side, rather in front of the ischial tuberosity, a boggy, ill-defined, fluctuating swelling. Upon incising this, some very foul, dark, and thin discharge came away; at the same time I withdrew from the cavity some long string-like sloughs.

The parts above the pubes were still tender and hard, and pressure over that situation caused some discharge from the perinæum. He again refused to remain in the hospital, went away, and I did not see him again.

In two other cases which have happened under my observation aspiration of the bladder has been followed by pain, supra-pubic rigidity, and nausea, in one case lasting five hours, in the other nine, after which the symptoms subsided without further complications. In both instances the urine evacuated was very foul.

The first of these cases presents an undoubted instance of the extra-peritoneal rupture of a diseased bladder, the direct result of its puncture by an aspirator needle.

So far as its causation is concerned, I believe it is the first case of the kind recorded. It is interesting as showing the remarkable relief afforded by clearing out the urine which has escaped from the bladder into the pelvic cellular tissue, even in the case of a patient who was apparently moribund.

Considering the great tenacity for life exhibited by this man, I have very little doubt that, could I have operated a few hours after the rupture occurred, the case would have probably terminated in recovery.

Case 2, I believe, was an instance of the escape of a few drops of decomposing urine into the cellular tissue around the bladder wound, resulting in inflammation and sloughing, fortunately somewhat limited in extent.

In the other cases mentioned, it is not unreasonable, I think, to suppose that the temporary pain and rigidity may have been accounted for by the passage of the needle over the cellular tissue about the puncture, immediately after having been steeped in foul urine.

A careful consideration of the cases described in this paper, and the importance, in my opinion, of the points mentioned in connection with the objections to producing a wound in the diseased bladder walls, without effecting an immediate and decided relief of tension, as well as the obvious risk which may occur in the withdrawal of a foul needle through healthy perivesical cellular tissue, lead me to submit the following conclusions:

1. Aspiration of the bladder for the relief of retention of urine is a more serious proceeding than is usually supposed, and can only be resorted to with safety in recent and acute cases in which the bladder walls are presumably healthy.

2. The operation is absolutely inadmissible in cases of long-standing stricture with chronic difficulty in micturition ending in complete retention, the bladder walls being in such cases hypertrophied, rotten, or otherwise diseased, the appropriate treatment for these cases, if the stricture be impassable, being drainage of the bladder through a

perinaeal incision, the stricture being divided or not at the time of operation as required by the conditions of the case or in accordance with the custom of the operator.

3. The aspirator can be used only with some risk in cases of retention where there is reason to believe that the urine is foul, unless the means are at hand by which an antiseptic solution may be introduced into the bladder before the withdrawal of the needle. Even under these circumstances it is only applicable to cases in which the retention is due to prostatic enlargement where there has been no long-continued previous suffering from cystitis, irritable bladder, or vesical atony; such cases being more appropriate for treatment by prostatotomy and perinaeal drainage.

4. In cases of retention, from any cause whatever, where it is probable that the bladder walls are diseased, or the urine foul, if the surgeon decide to tap the bladder instead of performing the major operation, the paracentesis should be done with a *large trocar and canula*, and not with a fine aspirator needle, for reasons already stated.

5. In the event of an attempt at aspiration being followed by pain and rigidity, with or without vomiting or nausea, lasting for twelve or fifteen hours, the good of the patient would be best consulted by free incision above the pubes, and drainage of the bladder through the perinaeum at the same time, if the urethral or prostatic obstruction be impassable by catheter.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 203.)