ON INTERNAL URETHROTOMY BY AID OF A NEW URETHROTOME.*

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I DO not propose on the present occasion to discuss in full the general merits and demerits of the operation of internal urethrotomy, nor to comment upon and criticise the published opinions and experience of the many distinguished surgeons who have hitherto praised or condemned this operation; still less do I propose to discuss in detail the comparative advantages and disadvantages of the several methods and instruments that have been from time to time devised and recommended for its performance.

I wish rather, in the first place, to indicate the circumstances and considerations that have led me to make trial of the operation of internal urethrotomy, and to the belief that this operation will probably prove to be a safer and more permanently successful method of treatment in exceptional, if not in ordinary, cases of urethral stricture than, so far as I know, is at present commonly supposed and represented. Further, I wish to submit to the meeting the instrument I have devised, and the method I have adopted, and to point out and illustrate, so far as I may be able, what appear to me to be their especial merits and advantages. And, lastly, I propose very briefly to state the results of my experience hitherto, however limited and imperfect, and therefore inconclusive, such experience must be considered to be.

Although, however, my experience of internal urethrotomy is at present limited to but few cases, I may venture, without undue assumption, to assert that my experience in the treatment of stricture of the urethra has been both considerable and extensive: considerable in regard to the number of cases, and extensive in regard to the variety of forms and complications presented, and the methods adopted for giving relief. In common, I believe, with every surgeon of experience, I have become more and more impressed by the want of permanence in the success obtained by the ordinary methods of treatment of stricture of the urethra, however great and striking may have been the relief temporarily afforded; and, from time to time, with increased opportunities, I have met with an increased number of cases in which the ordinary methods have been either altogether inapplicable, or at best have proved ineffectual in affording any satisfactory measure of even temporary relief.

My care in which internal urethrotomy had been previously practised, but in which I am convinced equally good (if not better and more permanently good) results might have been easily obtained by ordinary methods of dilatation. And I have at the present time under treatment one of the most difficult cases of stricture I have ever had to do with, in which it seems to me manifest that the obvious tortuosity of the existing passage is due to the effect of an internal urethrotomy performed some time since. It seemed to me that what was wanting was some method by which the natural passage should be restored, and the stricture-substance (if I may use such a term) got rid of by absorption or otherwise, rather than a method by which a new passage should be made above or below the strictured part. With the view of supplying such method, I devised the instrument which I now venture to bring before you. It has gone through several modifications suggested by experience in its use, and I do not for one moment pretend that it has yet reached anything like perfection; but I cannot help believing that the principles involved in its construction and application are worthy, at any rate, of consideration and more extended trial than has yet been made of it.*

The instrument consists, in the first place, of a slender steel guide curved in catheter form. (Fig. 1.) This is hollow, and either open at the extremity, for adaptation by screw to a filiform whalebone bougie previously passed after the method of Otis and others, or else closed and rounded at the extremity with openings like those of a catheter for the indicative escape of urine. This guide has four longitudinal grooves (too fine to be represented in the figure) throughout the extent of the straight portion. To facilitate the manipulation of the guide, a small ebony handle (Fig. 2) is slid on to it and fixed by a screw. When the guide has been introduced through the stricture and the bladder has been reached, as evidenced by the escape of urine or otherwise, the handle is removed, and the main part of the instrument is slid on. This consists of a tube (Fig. 3) having a hollow cylindrical handle at the proximal extremity (a), and at the distal extremity an elongated slightly tapering olive bulb in which are four slits (b). Sliding within this tube is a second (Fig. 4), somewhat longer, and furnished at the distal extremity with four sharp-pointed sharp-edged blades (a); its proximal extremity is expanded into a circular flat plate (b), between which and the top of the handle of the outer tube is an adjusting screw (c); when this adjusting screw is down on the top of the handle, the blades are securely fixed within the olive bulb of the outer tube, and in this state the instrument is slid down upon the guide until the stricture is reached. The whole instrument put together is shown in

Such being the case, I have often considered the question of internal urethrotomy. But, without doubting or wishing to dispute the excellent results recorded by others, I have been deterred until recently from adopting the operation, because none of the methods with which I was acquainted commended themselves satisfactorily to my judgment. In this I may have been mistaken; but it appeared to me that, in many of the successful recorded cases, simpler and less hazardous methods might have proved equally efficacious, and, still more emphatically, that the various instruments devised were either wanting in precision and accuracy of application, or else that they served to cut a fresh way by the stricture into the urethra beyond rather than effectually to operate upon the strictured part itself. I have had cases under

Fig. 5, with the filiform conductor attached: a is the plate of the inner tube, pressure upon which causes projection of the blades; b the adjusting screw. The bulb being then firmly applied to the face of the stricture, the adjusting screw is turned up so far as may be deemed desirable. Pressure upon the top plate of the inner tube will then cause projection of the blades through the slits in the bulb (Fig. 6), and the strictured part of the urethra will be cut to a slight depth at four points in its circumference. Removal of the pressure is followed by withdrawal of the blades within the bulb by spring action (the spring being in the cylindrical handle of the outer tube). The bulb is then pushed on. If the stricture have been divided to a sufficient extent, the bulb will pass freely on. If it should still be arrested, another and another

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* I am much indebted to Messrs. Mayer and Meltzer for the pains they have taken in carrying out my suggestions.

projection of the blades may be necessary, and can, of course, be easily accomplished. Such projection of the blades is repeated until it is manifest that the strictured part has been sufficiently divided, and the bulb can glide on beyond it. The instrument is then withdrawn and a full-sized catheter at once introduced.

The advantages which this instrument seems to me to offer are these :

1. The facility and safety with which it may be used, and the accuracy and precision with which it may be made to act upon the strictured part of the urethra and no other.

2. The exactly limited depth to which the incisions extend. They can scarcely be made to a greater depth than what corresponds to the proper circumferential extent of the urethra.

3. Four incisions of slight depth into the stricture-substance (if I may use such a term as I have said), are made instead of one incision of comparatively great depth, as with the ordinary instruments, and which may, and probably often does, extend considerably beyond the stricture-substance into healthy tissue. Thus the stricture-substance is more effectually treated, and the healthy tissues have better chance of escape. And here I would point out that the effect of incising the cartilaginously hard stricture-substance may be not inaccurately compared to the effect familiar to all surgeons produced by notching or incising the thick callous edges of certain old external ulcers. In this latter case, we see how speedily new action is set up, and how the indolent indurating material disappears and a healthy healing process is started and established. May it not probably be the same with the stricture-substance?

4. The stretching and dilatation of the previously strictured part is obviously rendered more uniform.

5. And, lastly, the healing or cicatrising process is facilitated, inasmuch as the extent of cut margin from which cicatrization can go on is necessarily greater in the case of four shallow cuts than it would be in the case of one cut made so deep as to allow of equal dilatation of the passage.

Having thus described the instrument I have devised, and indicated what appear to me to be its advantages, I pass on to state the results of my experience of its use ; and, very limited although such experience has at present been, the results have been such as to encourage me to persevere in its use in any seemingly appropriate cases that may come before me. Hitherto I have only had what seemed to me legitimate occasion for resorting to this method of treatment in twelve cases, but in all of these the results have been so far most satisfactory. To two of these cases I would especially ask attention, inasmuch as in them a degree of success was easily and speedily obtained far beyond anything that could have been expected to have been attained with equal ease and speed by any other method with which I am acquainted.

In none of the cases was there any hæmorrhage worthy of note. I have often seen more follow attempts at catheterism. In one case only was there anything like severe constitutional disturbance ; but the patient in this case was a man of very intemperate habits ; the symptoms from which he suffered more resembled those of a slight attack of delirium tremens than those of traumatic delirium ; he had but one rigor, and his temperature was only over 100 deg. on one day. In one case only was severe pain complained of after the operation ; but in this case I am inclined to believe that the pain was due to the fact that I had introduced and left in a catheter of too large size (No. 12). In no instance was there any indication of extravasation of urine or of perineal abscess. In all cases, when last seen, the patients were able to pass urine in full stream, and a large sized catheter (10 or 12) could be introduced without hitch or hindrance. In all instances, the progress was more rapid, and the satisfactory result was obtained with less confinement to bed than, so far as I can judge, would have been the case if the ordinary treatment by gradual dilatation had been adopted, even supposing that such treatment had been applicable. In all cases except one, a catheter changed from time to time was fixed in for some days after the operation, the number of days varying according to the conditions and indications of the case. In the one exceptional case alluded to, the patient himself pulled the catheter out during the night after the operation. I thought the opportunity a good one for testing the desirability of dispensing with the retained catheter, and did not replace it ; but the result of the experiment was not such as to encourage me voluntarily to repeat it. The first day, the patient passed urine in an excellent stream ; but afterwards the stream became very much smaller, and there was considerable pain during micturition. It was not until a week afterwards that a No. 10 could be again introduced with facility, smaller instruments having been passed in the meantime, but not fastened in.

The questions, as to whether a catheter should be fastened in after the operation, and, if so, how long it should be retained, appear to me

to be very important, in regard both to the rate of progress and to the ultimate result of the case. I am inclined to think that the catheter should, unless contraindicated, be retained until the granulating process has been fairly established on the cut surfaces. But the only safe rule appears to me to be that in this, as in other points in practice, we must always be guided by the conditions and indications presented by the particular case with which we have to do, regardless of any hard and fast rule, however well founded, according to general or average experience, such rule may appear to be.

I may be permitted to give a few details of the two cases to which I have referred, as affording, in my experience, the best illustrations of the success and value of the operation.

The first case is that of a gentleman, thirty-eight years of age, who had suffered very severely from stricture of the urethra during the long period of nearly twenty years. He had had several attacks of retention, relieved from time to time by opium and hot baths. During the years 1867-1868, he was treated by constantly repeated applications of potassa fusa. After submitting to this treatment for two years, and, to use his own words, "enduring the most agonising pain with fortitude, he considered he had been sufficiently patient and persevering". No larger sized instrument than a No. 2 could ever be got into the bladder. He gave up his case as hopeless, and went to reside in Jersey. While there, his sufferings were somewhat diminished. He returned to London in January 1870, and again submitted himself to the potassa fusa treatment ; and, although he experienced no benefit whatever and suffered excruciatingly, he continued some months under this treatment, and then gave it up in despair. From May 1870 to May 1876, he received no surgical treatment whatever, the frequent attacks of retention being relieved by opiates, warm-baths, and suppositories. He became altogether "incapacitated from attending to business, could not enter society, and indeed was unable to venture many yards from home, in consequence of the bladder being unable to retain more than an infinitesimal quantity of urine". "More than fifteen minutes' sleep at a time could not be taken ; and by May 1876, his general health was completely broken down, and his condition was such that neither he nor his friends believed he could survive much longer." Under such circumstances, I saw him ; and his condition was indeed deplorable. Any attempt to touch the urethra with an instrument gave rise to the most excruciating pain ; and it was obvious that, even supposing a fine instrument were introduced under chloroform, it would be impossible to retain it so as to effect any good. The bladder was in most wretched condition. The only thing to be done appeared to me to afford relief by means of opening the urethra behind the stricture, according to the method of Mr. Cock. This I did with most satisfactory result. His sufferings were at an end. He slept excellently well the whole of the night after the operation. The bladder, which before more resembled a sloughy abscess-cavity than anything else, gradually regained a healthy condition, and he steadily progressed, gaining health and strength until, free from all pain, he was able to get about, comparatively strong and well, with ease and comfort. He passed his urine freely through the perineal opening either with or without the aid of a catheter. I have mentioned these details to show the severity of the case with which I had to do. For some months, he was so well satisfied with his condition, that he declined to have any attempt made to restore the natural passage. In January of the present year, he wished, however, to have an attempt made ; and, accordingly, chloroform having been administered, I performed internal urethrotomy in the manner I have described. There was some considerable difficulty in getting the guide into the bladder ; but the long rest the urethra had enjoyed had permitted, at any rate, some of the inflammatory swelling to subside, and I was able to succeed. By alternately projecting the blades of the instrument and pushing on the bulb, I at last succeeded in tunnelling through all the strictured part of the urethra. The cutting must have extended through a length of at least two inches and a half. A No. 10 catheter was at once passed and fastened in. There was very little bleeding. From the day of the operation, the patient never suffered any pain worth speaking of, nor had he any bad symptom of any kind. The passage was perseveringly kept open by catheters, retained at first, and afterwards introduced whenever he wanted to pass urine, for some time ; and the perineal opening was allowed to close. Now, seven months after the operation, he passes urine in a good full stream, and a No. 10 catheter slips along the passage without hitch or hindrance. The urine is clear, and he has returned to active business occupation. I know no other method by which a like result could have been expected to have been attained.

The other case is that of a patient, thirty-six years of age, who had been the subject of stricture, gradually increasing in severity during ten or twelve years. He had led a very hard life in India and South America, constantly in the saddle, exposed to all sorts of hardships, and

never able to get proper surgical treatment. When he came under my care, in March last, his perinæum and scrotum were riddled with sinuses, through which the urine escaped, only a few drops coming from the orifice of the urethra. He was emaciated and broken down in health, and was evidently suffering most severely. After several attempts, I passed a No. 1 elastic catheter into the bladder, and, two days afterwards, performed internal urethrotomy. In this case, I had to cut through three distinct strictured portions instead of one continuous one. A No. 10 catheter was passed and fastened in. The sinuses were laid open to such extent and in such manner as seemed desirable. No bad symptom followed; but the greatest relief was experienced. In three weeks, the patient was up and about. The sinuses had apparently almost filled up. He was not allowed, however, to pass his urine without the aid of the catheter for another fortnight or three weeks, at the end of which time the old sinuses appeared fairly closed up. The improvement in general health and condition was rapid and marked. Three months after the operation, he declared himself better and stronger than he had been for years, and altogether free from pain and trouble about his urinary organs. He continued, however, to use the catheter at least once daily.

How far the good results obtained in these, and the other cases to which I have more briefly alluded, will prove permanent, remains to be seen. But, at any rate, a large measure of immediate relief has been afforded. And I cannot help believing that the new cicatricial tissue of an incised surface may prove less likely to contract speedily than the tissues around a stricture after ordinary methods of dilatation, and to become the seat of fresh inflammatory swelling and thickening.

In conclusion, I would venture to say that, although I have spoken so far in favour of the operation of internal urethrotomy, and so hopefully as to the results to be expected from it, I should be very sorry to leave the impression that I would advocate or practise this operation indiscriminately in all cases of stricture. For ordinary cases, I believe the ordinary method safest and best. Internal urethrotomy must be regarded as an exceptional operation, to be practised in exceptional cases. But, as such, I believe it well worthy of adoption—at any rate, of more extensive trial than it has yet had in this country.

ON STRICTURE OF THE URETHRA; WITH SPECIAL REFERENCE TO URETHROTOMY.*

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THE selection, by the officers of the Section, of Stricture of the Urethra, with special reference to Urethrotomy, as one of the subjects on which they invited discussion at the present meeting, must be my apology for offering the following remarks, rather than because I have much that is new either to suggest or to relate.

Perhaps their choice may owe something to the remark of my colleague Mr. Wheelhouse, in his communication to the JOURNAL last July, upon his method of performing perineal section: that, although the operation, as performed at Leeds, had been before the profession for some years, having been published by him in 1869-70, it had received but little notice either in the journals or in recent surgical works. Be that as it may, Mr. Wheelhouse's letter was followed in three months by the appearance of Mr. Teevan's most interesting and ingenious paper on an Improved Method of Performing the *Bouttonnière* Operation, in which he truly says: "In Leeds the operation is performed systematically, frequently; and I should say that, in that town, it is done more often in one year than in all the hospitals in London put together during the same period."

In support of this statement, I may say that I have performed it myself nine times in the last three years in hospital and once in private, and that each of my colleagues has done it many times within the same period. I can also assert that, of my own ten cases, eight were successful, and of most of them that they were seen several months after their discharge from hospital, when the results were found to be quite satisfactory as regards the cure of the stricture. In no case had perineal fistula resulted, and in one only had there been any untoward effect of any other description. To this case I will refer more particularly afterwards.

The two instances in which I was unsuccessful were both desperate cases. In one, extensive extravasation of urine had occurred before admission; in the other, there were large abscesses both in the scrotum and perinæum, with several fistulous openings from old abscesses, and

the patient was in a very low condition generally. Both these cases died within three to six days after operation.

The total number of operations for perineal section, done in hospital during the last three years, is thirty-nine, of which seven died; this gives a mortality of nearly 18 per cent.

According to surgical authorities, both English and French, various modes of procedure for the relief of stricture by urethrotomy are recommended; some of which are deemed to be preferable in one class of cases and some in another. Distinctions are drawn between the circumstances which render this or that operation the most applicable to a given case. Thus, in old cartilaginous strictures of the membranous portion of the urethra, complicated or uncomplicated by fistula in the perinæum, one or another modification of the *bouttonnière* operation is preferred. In cases of retention, where all attempts to pass an instrument through the stricture fail, and the urethra is distended behind the constriction, Mr. Furneaux Jordan counsels the opening of the distended urethra and division of the stricture from behind forwards; while in very tight strictures, where extreme sensibility of the passage resists treatment by dilatation beyond a certain limit, or where such treatment, as soon as discontinued, is followed by a return to the *status quo ante*—and especially when the stricture of this character exists in any part of the straight portion of the canal—internal urethrotomy by Civiale's method, or some modification of it, is often advised.

It is no doubt true of these operations, as it is of many other surgical procedures, that one method proves more frequently successful in the hands of one surgeon, while another method succeeds best in the hands of his friend. This is intelligible enough; for he who has familiarised himself with the steps and the minute details of a given operation, by the habitual adoption of it in a long series of cases (in which numerous varieties of conditions are sure to occur), is more likely to be able to accommodate it to the special requirements of an exceptional case; whereas his occasional adoption of a different method, with the minutiae of which he was not so familiar, might not improbably result in disappointment.

At Leeds, it has now for some years been customary to pursue that mode of perineal section—or "*bouttonnière*", as Mr. Teevan prefers to call it—(though why we should go to the French for a name when English serves our purpose I do not exactly understand) which has been fully described by Mr. Wheelhouse; and this, not only in the class of cases referred to above, but in almost every instance where it is considered necessary for the cure of a stricture, whether literally impermeable or not, to incise it, so as to pass a full-sized catheter into the bladder.

The main features of the operation (though they are before the profession) may be briefly epitomised here.

1. The introduction of Wheelhouse's straight button-ended staff, grooved to within half an inch of its extremity, down to the strictured point, with the groove looking forwards.

2. The opening of the urethra in the groove and not upon the point of the staff, so as to secure at least a quarter of an inch of healthy urethra in front of the stricture.

3. The seizing of the cut edges of the wound in the urethra by two pairs of straight-bladed nibbed forceps, while the staff is turned round and withdrawn sufficiently to hook up the upper angle of the opened urethra. A lozenge-shaped window is thus obtained, through which the stricture can be seen, and often the orifice in it can be detected.

4. The introduction of a finely probe-pointed director into the stricture, and through it on towards the bladder. This, of course, is the *crux* of the operation. It is readily to be conceived that, in cases complicated by false passages, the danger of proceeding to cut on the director, upon the supposition of its having entered the bladder, when it has not, should haunt the mind of the operator; but, as a matter of fact, I think I am justified in quoting Mr. Wheelhouse's expression, that its entrance is "clearly demonstrated by the freedom of its movements." Though difficult cases sometimes occur, I have never seen one in which the director has failed to guide safely.

5. The groove of the director having been turned downwards, the stricture is divided on its under surface by the scalpel, and a straight probe-pointed bistoury is afterwards carried along the groove, beyond the external wound, to insure complete division of all obstruction; and then,

Lastly, a most important and essential step, in order to insure the safe conduct of the catheter into the bladder: Teale's probe-gorget is guided along the grooved director into the bladder, dilating the stricture, proving by the gush of urine which flows along it that the viscus is reached, and forming a metallic floor over which the silver catheter cannot fail to pass safely to its destination.

Of the eight cases successfully operated on by myself, three were old cartilaginous strictures, which would admit of no instrument being passed through the meatus. Two belonged to the category of tight

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