

makes a false passage, he may be unconscious of the escape of the point of his instrument from the canal, but he will soon perceive that it is behaving unusually. It does not glide along as if in a healthy urethra; it is obstructed, but yet not held in the same manner as if in the grasp of a stricture. The point, moreover, seems often to be turned out of the median line, and, after the instrument has been introduced far enough to have reached the bladder, a rotary motion, imparted to the shaft, will show that the point is fixed in the connective tissue, and not freely movable, as it would be in the cavity of the bladder. In such a case a finger in the perinæum, or, better still, in the rectum, will almost certainly feel the point of the instrument just outside of the wall of the gut, at the apex of the prostate, or perhaps lying between the prostate and the gut. On withdrawing the instrument, blood flows freely from the meatus.

The treatment for a fresh false passage of this sort is, to let it alone absolutely for two weeks, if the patient can make water, and is in no pressing need to have his stricture relieved. Blood will flow for a day or two, then pus for a few days, and at the end of two weeks, in favorable cases, the passage opened by the instrument will have closed. Occasionally it remains open, suppurating for a much longer time. Urethral fever, with or without the formation of abscess, is not an uncommon result of false passage. Infiltration of urine is exceedingly rare. The great danger in these cases is in recommencing instrumentation too soon, entering the false passage before it has healed, and thus keeping it open indefinitely.

In avoiding an old false passage, which is the seat of chronic supuration, its position must be accurately studied out, by observing at what point in the urethra an instrument engages in it, and from which wall of the canal (upper or lower) it starts. The orifice of a false passage once accurately located, may be subsequently avoided by making an effort to present the beak of the instrument at a different portion of the canal, when passing the dangerous point. A new false passage does not grasp an instrument like a stricture, and in this way can often be distinguished from the latter. An old false passage, however, so far as its pathology is concerned, is a traumatic stricture. It has hard walls, and the unstriped muscle of the erectile tissue around it will "grasp" like any other stricture, thus depriving the surgeon of a very valuable means of deciding whether he is in the strictured canal of the urethra or not.

Another means, already alluded to, of avoiding a false passage when searching for the orifice of a narrow stricture, consists in filling the urethra with whalebone filiform bougies, thus mechanically filling up the false passage, until some instrument will glide by its orifice, and enter that of the stricture. This course, or that of using a spiral-pointed whalebone bougie, with its point out of line (Fig. 39), should be employed in

entering the stricture, whenever the symptoms are urgent, and false passage exists.

When a guide has passed the stricture, the latter may be divulsed, or cut, immediately. The size of the beak of the full-sized instrument, subsequently passed, will insure it from entering the false passage.

If it is impossible to get through the stricture, and there is retention, it becomes a matter of personal judgment to decide whether to perform external perineal urethrotomy without a guide, or to use the aspirator, and endeavor to pass the stricture at another sitting.

(b.) *Retention.*—A patient, with stricture, may be enjoying good health, when suddenly, after exposure to cold, after a dinner or a carouse, or after the passage of a small instrument through his stricture, he finds that he cannot pass water. If he does not get relief, his bladder will fill up, and after twenty-four to thirty-six hours, most of which are passed in acute suffering, a little urine will force its way through the stricture, and he will have overflow, often inaccurately styled incontinence. Such an over-distention of the bladder is liable to give rise to atony and cystitis, and, if the patient is seen before it has occurred, every means should be employed to avert it, and to preserve the bladder from an injury the effects of which are always more or less permanent. The most frequent cause of retention in stricture cases is sudden acute inflammation of the membrane lining the stricture, by which the already narrow canal becomes occluded. In this condition, as a rule, a fine catheter, or filiform bougie, can be introduced through the stricture, by the exercise of patient gentleness and skill. If the bladder can be reached, a flow of urine will follow the withdrawal of the instrument. If the bladder cannot be reached, the patient should be placed in a hot bath, more hot water being added after he has become accustomed to the first heat, and this carried as high as is bearable. He should remain in the bath from fifteen to twenty minutes, and will often be able to empty his bladder while in the water. Another excellent expedient is the use of the sitz-bath, at a temperature of 100° to 104° Fah., more hot water being added after the patient has entered the bath, which should be continued only for about three minutes, and may be repeated after an interval of fifteen minutes. If the heat is sufficient to induce nausea or faintness, it is more likely to produce the desired effect of relaxing the stricture.¹ A piece of ice in the rectum every few minutes may be tried (Cazenave).

Failing in these expedients, if percussion reveals a bladder only slightly distended, reaching not more than half-way up to the umbilicus, opium may be given, one grain being administered every hour until relief is afforded. The nervous excitability attending retention is relieved by opium. The pain will soon cease, the patient's fears will be

¹ In a robust and full-blooded subject, it might, perhaps, be advisable to take blood from the perinæum by a number of leeches.

come quieted, and after the fourth or fifth grain urine will generally flow. Twenty-drop doses of the sesquichloride of iron, administered every fifteen minutes, for a couple of hours, at the same time with the opium, seem to facilitate relaxation of the stricture. Finally, an instrument can often be introduced under the entire relaxation of anæsthesia.

In a case of retention, if a filiform bougie can be passed into the bladder, the advantage so gained should not be lost, but the stricture should be divulsed at once, if the history of the case show an advanced stricture, and there are no evidences of kidney-disease. If no instrument can be passed, we have impassable stricture, with retention, which requires other means for its relief. In drawing off the urine from a bladder suffering from overflow, it is wise never to empty the viscus entirely, at first, if it has been long over-distended. Fatal collapse has been caused by such a course, and subsequent inflammation of the over-stretched mucous membrane is more likely to run high if all the tension be taken from it at once. Half or three-quarters may be withdrawn, the bladder being emptied entirely on the following day. This fear of collapse from emptying an over-distended bladder mainly applies, however, to old subjects suffering from enlarged prostate, and stagnation of urine.

(c.) *Retention, the Stricture being impassable.*—No stricture (congenital atresia excepted) is impervious unless the urethra has been cut across and united anteriorly, all the urine escaping behind it, or unless stricture has gone on contracting for an indefinite period, the urine escaping through large fistulæ. Where a drop of urine can pass, the stricture is pervious, but nevertheless it may be impassable to any instruments we may use, or any skill and patience we may bring to bear upon it, and that, too, where the urine flows in a considerable stream. Treatment of impassable stricture without retention has been already described (p. 154).

When, however, there is retention, the question immediately arises, Is it better to operate on the stricture at once, or to puncture the bladder and wait till the following day, in hope of operating then under the more favorable conditions of a guide through the stricture? This is a point which requires the best judgment, aided by considerable experience, to decide correctly. Here there is no question of any other complication. The surgeon is in face of an impassable stricture, and the patient has retention, and must be relieved, or his bladder will suffer. If the patient has had retention before, his experience then will aid in forming a judgment. If the surgeon is acquainted with the temper of the urethra, and the character of the stricture (resiliency, traumatic origin), he may found his opinion on such previous knowledge. If the patient is difficult to manage, and there is fear that, once relieved from his present necessity, he may not submit to treatment, it would be only a kindness to him to take advantage of his misfortune to insist upon

perineal section at once, and put him in the way of passing a large instrument and keeping off further trouble, thus relieving retention, and subjecting the stricture to effective treatment by one operation.

But external perineal urethrotomy without a guide is an exceedingly difficult operation, and is not to be undertaken unadvisedly. If it is the patient's first retention (brought on by exposure), and if he was previously passing a moderately good-sized stream, if the bladder is not already too full, it is always well to try warm baths and opiates to relieve retention and to leave the stricture for subsequent treatment. Again, if the bladder is very full, and there is still no absolute necessity for external perineal urethrotomy, the bladder should be punctured above the pubis, with the aspirator, and a filiform bougie engaged if possible in the orifice of the stricture, and left to act by continuous dilatation (p. 165). On the following or next following day the filiform bougie will generally pass into the bladder, and then the stricture will be under control.

(d.) *Infiltration of Urine.*—In stricture complicated by extensive infiltration of urine, we have a condition requiring prompt action on the part of the surgeon. The stricture must be relieved. The infiltrated urine must be drained off, or extensive abscesses, with sloughing, will follow, and the patient's life be placed in imminent peril—results which may ensue in spite of all precautions. When the infiltration has occurred behind the triangular ligament and is confined to the cavity of the pelvis, but little can usually be done, except to keep up the strength by brandy, carbonate of ammonia, and beef-tea, trusting that Nature will set up a plastic inflammation and thus limit the burrowing of the infiltrated fluid, and allow its escape by the formation of abscess (pericystitis). Even in these cases, however, desperate as they are, where the escape of urine has been sudden and in considerable quantity, early operation is often the only chance. They are similar to, and must be treated like, cases of rupture of the bladder, the neck of the bladder being cut into, as in the lateral operation for stone, all stricture-tissue being divided and a chance given for the infiltrated urine to escape, while further damage from infiltration is rendered impossible.

If infiltration occurs along the course of the urethra outside of the triangular ligament, and is slight and circumscribed, the urine not having penetrated Buck's fascia, but manifesting itself in a hard, circumscribed perineal swelling (p. 142) behind the stricture, no surgical interference is called for, so long as the hard lump is not rapidly increasing, and the patient can empty his bladder. Should retention occur under these circumstances, or the hard lump commence to enlarge rapidly, external perineal urethrotomy is the only proper resource. In this variety of infiltration there is often time to build up the patient's general condition by the judicious employment of hygiene, air, tonics, etc., and sometimes to avert the consequences of long-continued abuse of stimulants, includ-

ing delirium tremens, often imminent in cases encountered in hospital practice. Should external perineal urethrotomy be performed, the hard lump must be incised in the median line, and the stricture thoroughly divided.

But these indurations do not necessarily suppurate externally. They usually remain stationary for a long time, often get better under treatment, sometimes (rarely) spontaneously subside, probably by discharging internally through a small orifice.¹

When a large quantity of urine has suddenly escaped, burrowing into the subcutaneous tissue of the perinæum, scrotum, thighs, and abdomen, large, free incisions, calculated to insure effective drainage, should be made well down into the subcutaneous tissue, wherever œdema or emphysema is felt, and external perineal urethrotomy must be performed. A thorough division of the stricture prevents further infiltration. If the scrotum be infiltrated, it should be split into two lateral halves, while other incisions may be made freely into its substance. Too free incisions are not to be feared; the error is on the other side. Incisions must be bold, deep, numerous, and should extend over all the surfaces involved by infiltration. The operative indications, in cases of extensive infiltration, are three:

1. To stop progressive infiltration by extensive dependent incisions.
2. To provide an escape for urine constantly collecting in the bladder, by free central incision of the urethra behind the stricture.
3. To divide the stricture thoroughly, although this may be left for a subsequent operation.

In making incisions, a finger in the rectum should search for boggy spots, which, when found, should be opened into. Brandy and carbonate of ammonia, freely administered in small, frequent doses, will bring down the pulse as the patient rallies from shock. The subsequent treatment must be sustaining in every way. Erysipelas is apt to come on.

Gangrenous spots appearing after incision should be poulticed with charcoal or yeast, and linseed-meal until they separate, and the raw surfaces afterward dressed with simple stimulating applications until they heal. Recoveries after infiltration seem sometimes almost miraculous, and life is not to be despaired of even in cases of the most extensive sloughing. Too much attention cannot be bestowed upon keeping up the patient's strength. This is his salvation; it must be maintained at all hazards.

(e.) *Abscess*, complicating stricture, has already been described as perineal abscess (p. 79), and as a hard, circumscribed swelling in the

¹ Dr. E. A. Banks, of New York, brought a patient for inspection, who with tight stricture had two of these deep perineal indurations, one as large as a pigeon's-egg, evidently firmly attached to the urethra. Before agreeing to external section, which was advised, Dr. Banks tried "continuous dilatation," with the effect of overcoming the stricture, and causing the disappearance of the indurations after a few weeks. The treatment, however, provoked epididymitis, and caused some urethral irritation.

perinæum attached to the urethra (p. 142). For all these, when complicating stricture, the treatment which usually yields the best results is external perineal urethrotomy, including the abscess and the stricture in one free median incision. The opening should be made before fluctuation can be detected, at any time if the bladder is suffering. Success of treatment usually depends upon the earliness and freedom of the incision: *cut deeply in the median line*. There is nothing to fear. Hæmorrhage can always be restrained by tying spurting points or plugging the wound if necessary around a "shirted canula," or by a piece of fine sponge through which a female catheter has been passed.

(f.) *Fistulæ*, as complicating stricture, are important just in proportion as they are large, long, or numerous. A simple fistula with one or two openings, which allows a few drops of urine to escape at each act of micturition, need not be regarded. Such a fistula will close spontaneously, in the vast majority of instances, as soon as the stricture has been dilated fully, as Brodie pointed out. The first and essential step in the treatment of all fistulæ complicating stricture is, to remove obstruction to the free escape of urine, and then to treat the fistulæ, if they do not get well spontaneously. Such after-treatment will rarely be required unless there has been loss of substance. If, however, after *full* dilatation has been maintained for some months, the fistulæ still allow urine to pass during micturition, the following expedients may be resorted to:

Dilatation being maintained, the patient should be further taught the use of a flexible (French) olivary catheter of medium size. This he must introduce at intervals, passing no urine except through the catheter, if it can be done without producing urethritis. If this fail, after thorough trial for a month or more, where the stricture has been fully dilated and is not resilient, the hard edges of the fistulous tract should be incised and cleaned, and the fistula left with its external larger than its internal orifice. If the edges are not callous, and particularly if the fistula is long and deep, cauterization is sometimes effective. This is best accomplished by galvano-cautery, a wire being introduced, suddenly raised to white heat, and instantly withdrawn. Red-hot iron is not reliable, as it becomes cooled on introduction, and produces least effect where most is required, i. e., at the internal orifice of the fistula. Another expedient is to bend a silver probe until it readily traverses the whole length of the fistula, coat it with fused nitrate of silver, introduce it rapidly, and rotate it during withdrawal.

It must not be forgotten that these means last detailed are only accessory to the sound, and by no means in themselves reliable for cure. During their use the catheter and full-sized sound should be continued unremittingly. In general, the capacity of the urethra is underrated, and fistulæ which do not get well owe their intractability to the fact that the stricture has not been brought to the full size of the canal. If

the urine can flow out freely enough, it will choose the larger and neglect the smaller channel, allowing the latter to heal. Tonic contraction of the urethra in front of stricture, due to long inactivity of the canal, seems to be the obstacle in some cases. A search, in the track of fistulæ which refuse to close, will sometimes reveal stone as the cause.

Where from the mismanagement of previous abscess there are numerous fistulæ, opening in all directions around the penis, scrotum, and perinæum, running through indurated tissue, and, perhaps, lined by calcareous matter; or where fistulæ coexist with abscess in the perinæum, or a lumpy induration of some extent around the urethra—in any of these conditions sound surgery calls for external perineal urethrotomy. The incision should be central, all abscesses and fistulous tracts being opened into this, and every thing forced to heal from the bottom.

When a fistula has one opening in the *rectum*, the obstacle to success of treatment is often the passage of fecal matter and gases into the urethra. If, after cure of the stricture, simple means (cautery, incision) fail, Sims's silver suture with forced dilatation of the sphincter ani might become necessary.

(g.) *Peri-cystitis, or Advanced Interstitial Cystitis.*—In nearly all cases of stricture there is necessarily more or less cystitis (inflammation of the mucous lining of the bladder), especially about the neck, but, in the majority of cases, the bladder complication does not influence, in any degree, the treatment which the general conditions of the stricture call for. Where, however, active interstitial cystitis complicates a tight stricture, or where the muscular substance of the bladder and surrounding tissues are much involved, rest must be given to the bladder, and this is usually best effected by external urethrotomy, if any active measures are allowable; otherwise a supporting and stimulating general treatment gives Nature the only chance (and that a poor one) of bringing the patient safely through. Particularly in all cases of cystitis is it necessary to make the urine unirritating as it flows from the kidney, to alkalinize it through the stomach, that it may be less alkaline at the meatus. G. Owen Rees¹ has demonstrated the possibility of doing this, by giving alkalies by the mouth, thus rendering the urine alkaline or neutral at the kidney. Alkaline urine, with a fixed alkali, does not irritate the bladder, and consequently less mucus is secreted (than when the urine was acid), to act as a ferment, decompose the urea, and give rise to the formation of carbonate of ammonia, that powerful volatile alkali which is the agent in decomposing urine most active in irritating and inflaming the bladder, and which, indeed, gives the alkaline reaction to the urine of chronic cystitis. Lemon-juice in quantity, and benzoic acid, will render the urine of a healthy individual acid; not so when the

¹ On the "Pathology and Treatment of Alkaline Conditions of the Urine," Guy's Hospital Reports, Third Series, vol. i., 1855, pp. 300, 301.

bladder is inflamed; then alkalies are more likely to produce the desired effect.

(h.) *Enlarged Prostate.*—The complication of stricture by enlarged prostate is not of common occurrence. The situation is always grave when the two conditions coexist, if the enlargement of the prostate is sufficient to interfere with the passage of instruments into the bladder, and the stricture is situated as deep as the bulb, or beyond it. The tighter the stricture the more serious does the complication become, and, should retention supervene, the difficulty of the situation is apparent at once, whether the obstacle to the escape of urine be situated at the strictured point or in the prostate.

If the stricture is in the pendulous urethra, it may be dealt with by nearly any one of the means already described. It may be kept dilated with a straight steel sound of proper size, very conical, and not over five inches long (Fig. 56), while the proper treatment is applied to the bladder laboring under prostatic obstruction. If the stricture is



FIG. 56.

deep-seated and not very tight, but if neither short instruments nor the short curved sound will pass the prostate, a silver catheter of long curve should be selected, which will enter the bladder through the enlarged prostate, and steel conical dilating instruments should be constructed of the same curve. When the urethra has been dilated, the sound may be replaced by the catheter to be habitually used. If the stricture is not large enough to materially obstruct the urethra, and retention occurs at the neck of the bladder, the prostate would require all the care, and the stricture might be subsequently attended to, after passage for some instrument into the bladder had been established.

If the stricture is very small, so as to admit only a filiform bougie, there still being no retention, a course may be followed which has been recommended at one time or another for nearly every condition of tight stricture, but which, indeed, is rarely advisable, as we have so many that are better, namely, the tying in of an instrument which has passed through the stricture. It is known as "continuous dilatation."

Continuous Dilatation.—The execution of the treatment and its action are as follows: A filiform bougie, whalebone or soft, is passed through the stricture, which "grasps" it tightly, and is tied in (Chap. X.). The first action of this instrument upon the stricture is to cause irritation. The muscular fibres of organic life which surround the urethra at the point of stricture contract tightly upon the instrument, producing the "grasping" so often referred to. This continues for a while and