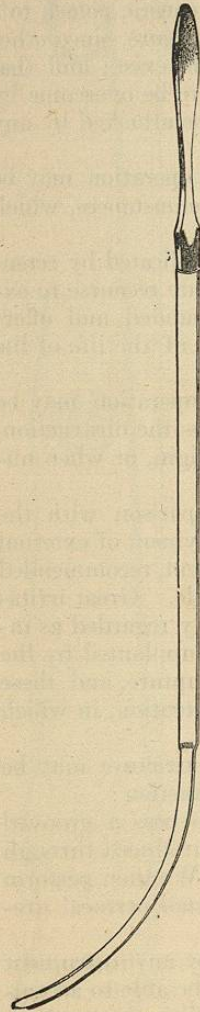


the normal channel has become so obliterated that it cannot be traced, and a new and artificial channel must be formed ("Cock's operation").

FIG. 99.



Syme's staff.

Whichever of these methods may be called for, it is highly desirable, unless the urgency of the case forbids, that the patient should be prepared for the operation by a period of rest, during which he should be confined to the house, and, for the most part, to the horizontal posture, his secretions be regulated, and his system placed in as favorable a condition as possible. The perinæum should be shaved, and the rectum evacuated by an enema. At the time of the operation, the patient having been brought under the influence of ether, he is placed upon the edge of a table, facing a good light, in the position for lithotomy, with the hands bound to the feet by bandages, or by Pritchard's anklets, and an assistant supporting each knee.

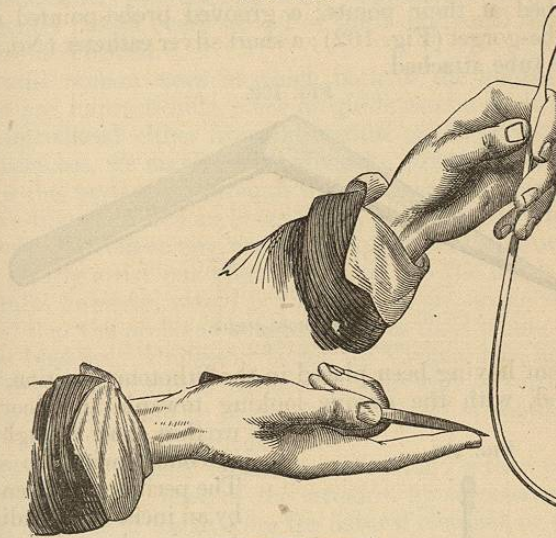
When Syme's operation is practicable, the staff bearing the name of this surgeon (Fig. 99) is introduced through the stricture, or, if this be found impracticable, a sound, channelled on its convexity, and tunnelled at its extremity, as represented in Fig. 100, should be passed down to the anterior face of the contraction, threaded, if possible, upon a fine whalebone bougie, which it may have been possible to introduce into the bladder, and which will serve as a guide to the sound, after the incision in the perinæum has been made. The sound should now be intrusted to the assistant on the patient's left, who also elevates the scrotum out of the way of the operator. The staff is to be held accurately in the median line, and its convexity made somewhat prominent in the perinæum. The surgeon, sitting upon a stool in front of the patient, enters his knife into the centre of the perinæum, and makes an incision an inch and a half or two inches long, exactly in the median line, cutting down upon the groove of the staff; using this as a guide, the stricture beyond can be readily and freely divided on its lower aspect. It is generally recommended in books to make this division by successive strokes with the knife from behind forwards, as represented in Fig. 100, lest, if made in the opposite direction, the knife, after severing the stricture, and ceasing to meet with resistance from the induration, unnecessarily wound the deeper tissues. As a matter of fact, however, I believe this rule is not observed; at least, I have never seen it carried out, and have

found others, as well as myself, accustomed to make the incisions in the opposite direction, *i. e.*, from before backwards.

A grooved director is now to be introduced into the bladder through the perineal incision; the staff is withdrawn, and a full-sized sound or catheter inserted from the urethra and, guided by the director, into the bladder, to ascertain if the strictured portion of the urethra has been completely cut.

When the stricture is found impassable, and we cannot, therefore, have the assistance of a staff, as in Syme's operation, a full-sized channelled sound is to be introduced as far as the anterior face of the

FIG. 100.



(After Thompson.)

obstruction, and an incision to be made upon it from the perinæum, as in the previous operation. An effort should then be made to pass an instrument through the stricture by way of the perineal opening. For this purpose, the edges of the incision should be held apart by the fingers of assistants, or by means of hooks, or, better still, as proposed by Mr. Avery, a ligature may be passed through the arethral mucous membrane on either side, in order to afford a clearer field of view, and indicate the position of the channel; and the blood should be removed by constant sponging. The most desirable instrument to insert is a grooved director; if this cannot be passed, a fine flexible bougie, or even a bristle, may be tried. Considerable time, patience, and perseverance are required in this part of the operation, which often occupies from fifteen to thirty minutes, but in most cases one of the above instruments may eventually be passed and employed as a guide for the completion of the operation.

Mr. Wheelhouse,¹ of Leeds, has further methodized the steps of this operation and introduced some new instruments for the purpose, which are highly spoken of by English surgeons.

The following are the special instruments required in Wheelhouse's operation:

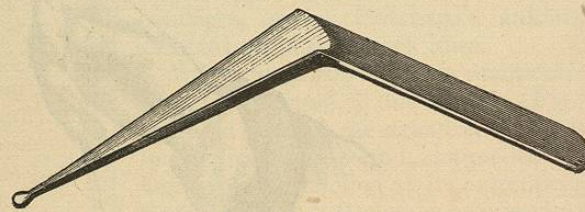
FIG. 101.



Grooved staff with button-like end.

A staff, grooved to within a half inch of its extremity, which terminates in a rounded button-like end (Fig. 101); two pair of straight forceps nibbed at their points; a grooved probe-pointed director; Teale's probe-gorget (Fig. 102); a short silver catheter (No. 10 or 11) with elastic tube attached.

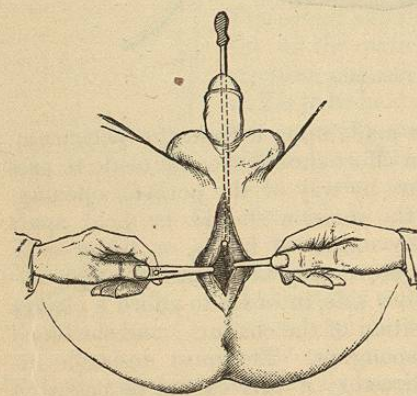
FIG. 102.



Teale's probe-gorget.

The patient having been placed in the lithotomy position, the staff is introduced, with the groove looking towards the floor of the urethra, and brought gently

FIG. 103.



Wheelhouse's operation of opening the urethra.

in contact with the stricture. The perinæum is then divided by an incision extending from opposite the point of reflection of the superficial perineal fascia to the anterior margin of the sphincter ani muscle. On reaching the urethra, that canal is to be opened in the groove of the staff, thus securing at least a quarter of an inch of healthy undivided tissue anterior to the stricture. The edges of the incision being held apart by the nibbed forceps, the staff is gently withdrawn and turned around so that the bottom may hook into the anterior angle of the incision. The urethra may thus be stretched open at three points and the operator may look into it directly in front of the stricture.

¹ British M. J., London, June 24, 1876.

The probe-pointed director is then passed into the urethra through the cut, and, even if the opening of the stricture cannot be seen, it usually succeeds in finding the way. The director, having reached the bladder, is held with its groove downwards, and along it the stricture is thoroughly divided. In order to insure the easy introduction of the catheter, the probe-gorget is passed into the bladder on the groove in the director, forming a metallic floor for the catheter to pass over. The short catheter, with the elastic tube attached, is then easily introduced from the meatus into the bladder; the gorget is withdrawn and the catheter fastened in and allowed to remain for three or four days, the urine being conveyed to a convenient distance by the elastic tube. On the fourth day the catheter is removed, and is subsequently passed every second or third day, until the wound in the perinæum is healed.

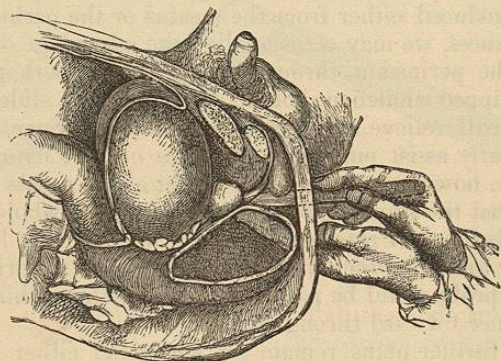
There still remain cases in which both of the above-mentioned operations are impracticable, since no guide can be made to pass the stricture, introduced either from the meatus or the perineal opening. In such instances, we may occasionally take advantage of a fistulous opening in the perinæum, through which we can, perhaps, insinuate a fine, olive-tipped whalebone bougie, and, upon this, slide a fine silver tube, which will relieve any urgent symptoms of retention present, and also greatly assist our efforts to trace out the natural channel. These fistulæ, however, would better be let alone, unless we can first be satisfied that the probe or bougie traverses their whole course and enters the bladder. Professor Dittel, of Vienna, has, however, reported a few cases in which perineal fistulæ were so fortunately situated that a probe could be passed into the urethra behind the stricture and thence forward through it.

Only two further plans remain for adoption: either to carefully cut into the indurated mass of the stricture by successive strokes of the knife, in hopes of discovering the natural channel, or to open the dilated urethra behind the obstruction, and then endeavor to pass a probe through it from behind forwards. During the latter operation, after each stroke of the knife the parts should be carefully examined by the finger, and if a fluctuating point can be felt, it is probably the dilated urethra, and should be opened. In spite of all our efforts, it may be impossible to trace the contracted and thread-like remains of the normal passage, and we must content ourselves with opening the urethra back of the obstruction, and establishing an artificial channel with the penile portion of the canal. This may be found, eventually, to supply the place of the original passage in quite a satisfactory manner.

In performing the operations above described, there is one anatomical point which should always be borne in mind, and that is the position of the opening in the triangular ligament through which the urethra passes. This is situated at three-fourths of an inch, or about a finger's breadth, below the arch of the pubes. It is often sought for too far backwards, and too near the anus.

Cock's Operation.—Mr. Cock, of Guy's Hospital, advocates, for the relief of retention of urine, the opening of the urethra behind the stricture at the apex of the prostate, in the following manner: "The patient being in the lithotomy position, the left forefinger of the operator is placed in the rectum, with its tip at the apex of the prostate, the relations of which should be carefully ascertained. A double-edged knife is then plunged steadily, but boldly, into the median line of the perinæum, and carried in a direction towards the tip of the forefinger, which lies in the rectum, while, at the same time, by an upward and downward movement, the incision is enlarged in the median line to any extent that is considered desirable. The lower extremity of the wound reaches to within about half an inch of the anus. The knife is pressed steadily onwards towards the apex of the prostate, until its point can be felt in close proximity to the tip of the

FIG. 104.



Tapping the urethra in the Perinæum. (Bryant.)

left forefinger, and is then made to pierce the urethra by advancing it obliquely either to the right or left. The finger is still kept in the rectum, while the knife is withdrawn, and a probe-pointed director introduced through the wound into the urethra and passed into the bladder. The finger is then withdrawn and the director held in the left hand, while a canula or female catheter is slid along its groove into the bladder, where it is retained for a few days."

Furneaux Jordan, of Birmingham, England, recommends opening the urinary track from the rectum, and passing a soft instrument forward through the stricture and out at the external meatus, the other end being carried into the bladder. He states that, in some instances, he has found the distended bladder itself coming down as far as the anal sphincter, in which case this viscus may be incised with a bistoury, followed by the introduction of the finger and the passage of an instrument forwards from the internal meatus to the external.

¹ Quoted from Ashhurst's Surgery, 2d ed., p. 930.

Retrograde catheterism has also been performed by taking advantage of a suprapubic opening into the bladder, through which an instrument is passed into this viscus, and thence forward through the urethra until it is arrested by the stricture. Brainard, of Chicago, in 1849, punctured the bladder above the pubes for the express purpose of such a procedure, and has been followed by Volkmann and others.

The after-treatment of either of the above operations of external urethrotomy is simple. The patient should be put to bed, with the thighs elevated, and the bedclothes supported by a cradle. Pain may be relieved by suppositories of opium, and one should be introduced within the anus, before the patient leaves the table. Subsequent hæmorrhage sometimes occurs, which it is difficult to arrest by ligature, since the thread does not retain a firm hold upon the gristly tissue of the stricture; it may, however, be effectually controlled by inserting a piece of compressed sponge between the edges of the wound, or firmly plugging it with lint, and bandaging the thighs together.

It was formerly the custom to tie a catheter in the bladder for twenty-four to forty-eight hours, but it is now believed, especially by Professor Van Buren, and others of our best American authorities, that this practice is not only unnecessary, but that it tends to favor urethral fever and other unpleasant symptoms. If a catheter be dispensed with, the urine escapes through the incision for a few hours, but is found to pass mainly through the natural channel by the following day, when the perineal opening is closed by the swelling of its edges.

Very disastrous results have been known to follow the prolonged retention of a *metallic* catheter after this operation, the chief of which is ulceration of the mucous membrane and subjacent tissues, in consequence of pressure of the instrument. This most frequently occurs at two points: one, that portion of the vesical walls which comes in contact with the extremity of the catheter; the other, the lower surface of the urethra, just in advance of the scrotum, at the commencement of the subpubic curve, where the penis is upheld by the suspensory ligament, and where any straight instrument, like the shaft of a catheter, necessarily presses upon the inferior wall of the canal; hence, if any catheter is to be retained, it should be a flexible one.

It might be inferred from the opinion expressed on a previous page, as to the permanence of the cure after free division in internal urethrotomy, that so free a division as is performed in external urethrotomy would require no further use of instruments, after the healing of the wound and the apparent restoration of the urethra to its normal calibre. Experience, however, shows the contrary, and demonstrates the necessity of the use of sounds at intervals, for an indefinite period, varying in different cases, or otherwise a relapse is almost sure to occur. Wherein the difference, if any, lies between external and thorough internal urethrotomy, I am unable to explain.

When perineal section is followed by a fatal termination, it is, in most cases, due to pyæmia; sometimes, to urethral fever, attended or not with suppression of urine, and, at other times, to hospital gangrene, erysipelas, or urinary infiltration.

CONSEQUENCES OF OPERATIONS UPON STRICTURES.—*Hæmorrhage* is not unfrequently an unpleasant accident following operations upon strictures, especially those of rupture and internal urethrotomy. It is not so much to be feared at the time of the operation as at some subsequent period, more particularly after the passage of urine, or on the occurrence of an erection at night. It shows itself usually within three or four days after the operation, but the patient, especially after internal urethrotomy, is not free from this danger for ten days or a fortnight—instances of its occurrence at this late period being now and then met with. Knowing the site of the stricture operated upon, the surgeon will be able to determine very nearly the situation of the bleeding point; moreover, if the latter be in the penile portion of the canal, the blood will flow continuously from the meatus, or, if in the portion of the canal posterior to the bulb, the blood may flow backwards, and even distend the bladder with clots.

The liability to this accident emphasizes the necessity of keeping a patient quiet, and preferably in a horizontal posture for some days after the operation, and also of his having a faithful attendant.

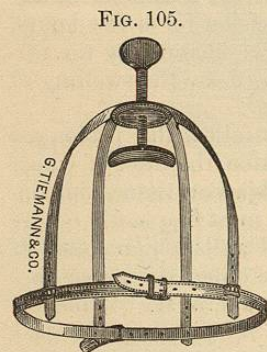


Fig. 105.
Otis's perineal tourniquet.

Should hæmorrhage occur, it may often be controlled by the application of ice to the penis and the perinæum. If obstinate, and the bleeding point be situated in the pendulous portion of the canal, a moderate-sized catheter should be introduced and pressure be exercised by a bandage encircling the penis. When the source of the bleeding is more deeply seated, pressure may be most conveniently exercised upon the perinæum in the following manner: Place upon the perinæum a pad of sufficient thickness; tie a bandage firmly round the waist; finally, pass an elastic bandage by a number of turns from behind forwards and from before backwards, between the buttocks and over the pad, from the waist-bandage behind to the same in front.

A less convenient way is to use a crutch, its lower extremity resting against the foot-board of the bed, and its upper against the perinæum of the patient. Dr. Otis has invented a tourniquet for the purpose (Fig. 105), and recommends that it should be applied loosely directly after the operation, so as to be tightened in a moment, if necessary.¹

Among the hæmostatics which may be given by the mouth in

¹ The multiplicity of the means advised to arrest hæmorrhage is suggestive of the liability of its occurrence. (See Otis, op. cit., p. 280.)

severe cases, ipecac and ergot are especially worthy of mention. Should the bladder become distended with blood-clots, it may be desirable to wash out this viscus with warm water injected through a catheter.

Curvature of the penis is met with in many cases following internal urethrotomy of the penile urethra. It may not be seen when the organ is at rest, but in a state of erection the virile member becomes bent usually to one side or the other, or in some cases either upwards or downwards, and it may be to such an extent as to interfere with or entirely prevent sexual intercourse. The extreme advocates of internal urethrotomy are inclined to make light of this accident, which is, however, for obvious reasons, very annoying and distressing to the patient. It may disappear spontaneously within a few weeks, but in some cases it continues for months and even for a year or longer. In the treatment of this accident, we have thought that some benefit was derived from supplying the patient with a straight sound and directing him to introduce it morning and night, and then to practice a certain amount of friction and of massage over it at the point of curvature. Dr. Otis states that in one instance of this deformity, which had lasted a year, he effected a cure by dividing the superior wall of the urethra in a diagonal line, using for this purpose a modification of his dilating urethrotome.¹

Urethral fever is a still more formidable sequence of operations upon the urethra, any one of which may occasion it. The exciting cause may be simple overdistension of the urethra by a larger bougie than has before been used; abrasions or laceration of its walls by rough handling of the instrument; the application of caustic; or the employment of the knife in internal or external incisions. The patient is suddenly seized with a chill, headache, vomiting, acceleration of the pulse, and in severe cases with great prostration and delirium. These symptoms are most likely to ensue upon the first act of micturition succeeding the introduction of a sound, or an operation of rupture or urethrotomy; in other words, they follow, and appear to depend upon contact of the urine with an abraded surface, through which urea or putrid elements find entrance into the general circulation; in other instances they are apparently due to the shock impressed upon the nervous system alone. This combination of symptoms, which is known as "urethral fever," is but one form of surgical fever, in the etiology of which the absorption of septic matter from the neighborhood of wounds plays so important a part.

In most cases urethral fever terminates in resolution, either with or without treatment, in the course of a few hours; but especially in persons affected with renal disease, and in some instances without apparent cause, a typhoid condition with delirium sets in, abscesses may form in different parts of the body, and speedy death ensue. Complete suppression of the urine is an occasional symptom, and is to be regarded as of very serious import.

¹ Op. cit., p. 290.

In order to conduct the treatment of stricture with safety, the general system should be in as favorable a condition as possible; the digestive organs in good order; and the patient should avoid excess both in diet and exercise. It is important also to abstain from any operative procedure during the persistence of raw and damp weather, or when the patient is fatigued or mentally depressed. If rigors occur after the operation, they should be met by the external application of heat and rubefacients, as bottles of hot water to the extremities, sinapisms to the spine and abdomen, hot blankets, etc., and internally by stimulants, quinine, and opiates. A full dose of the latter should be administered at the outset, and a smaller quantity be repeated every few hours, so as to maintain a steady narcotic action and lull the irritability of the nervous system. The reaction which generally follows should not be treated by active depletion; a tendency to general depression soon supervenes, in which the vital powers must be supported by stimulants and nourishment until nature shall have eliminated the toxic materials which have found entrance into the system. The value of aconite, administered in minute doses after an operation, as a prophylactic, has already been alluded to.

TREATMENT OF RETENTION OF URINE.

Retention of urine chiefly occurs either during the acute stage of gonorrhœa, when it is due to inflammation and spasm; or at some period of organic stricture, when, in addition to the causes just mentioned, permanent contraction of the canal plays a more or less important part in its production. It is less frequent in the former cases than in the latter, and presents less difficulty in the way of treatment. Remedial measures must vary somewhat with the condition of the patient, and be determined by the judgment of the surgeon.

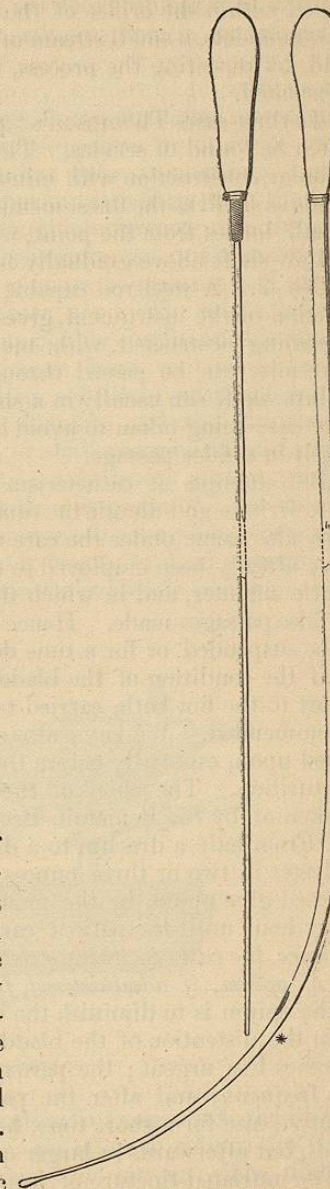
Relief may often be obtained by immersing the patient in a hot bath, the temperature of which should be raised to the neighborhood of 102° F. and this will probably require the addition of hot water after his entrance, since the bath cannot at first be borne at so great a degree of heat, and is moreover cooled by contact with the body. It is even desirable that a state of syncope should be induced, which will greatly favor the reduction of spasmodic action. In most cases the patient will pass his urine during immersion; otherwise, he should be rendered insensible by ether, and a medium-sized catheter, as, for instance, No. 15 (French), should be well-warmed and oiled, and an attempt be made to introduce it, following the rules already laid down, adhering closely to the upper surface of the urethra, stopping for a moment whenever obstruction is met with, and endeavoring to overcome it by gentle but continuous pressure. If these measures do not succeed, and the symptoms are at all urgent, we have a ready method of speedy relief in puncture of the bladder above the pubes by means of an aspirator—a procedure which may be said to be devoid of danger, and which has removed from simple retention of the urine nearly all of its former terrors.

But retention of urine most frequently occurs in patients with organic stricture, who, after exposure to cold, or after excessive indulgence in food and stimulants, suddenly find themselves unable to pass their urine. The bladder becomes distended, and before the aid of the surgeon is sought other complications may have taken place, as rupture of the urethra behind the stricture, infiltration of urine, the formation of an abscess, etc. As these conditions vary in different cases, so must the requirements of each be subject to the judgment of the surgeon.

A careful inspection should be made of the perinæum, since the retention may be due solely to the presence of an abscess or urinary infiltration, the evacuation of which will afford relief. When such collections form posterior to the triangular ligament, the external symptoms may be very obscure, and assistance in the diagnosis will be gained by exploration through the anterior wall of the rectum by means of the finger introduced through the anus. If any swelling or doughy hardness can be detected, we should endeavor to reach it through a free incision made in the median line of the perinæum. This can do no harm, and is likely to be of essential service.

The attempt is now to be made to relieve the bladder by the passage of a metallic or gum-elastic catheter through the stricture, and, in difficult cases, this may be best accomplished after first placing the patient under the influence of ether, which will greatly tend to relax spasm and relieve irritation. Previous acquaintance with the case will enable the surgeon to form some idea as to what instruments will be most likely to prove successful. Otherwise he will first proceed from moderate-sized catheters, both metallic and flexible, to smaller ones, and he will at least be able to inform himself as to the exact situation of the obstruction. If these instruments fail, he may still be able to pass a

FIG. 106.



Thompson's "probe-pointed catheter."