

2. To search behind the scar tissue for the dilated portion of the urethra.

3. To perform retrograde catheterization.

The first course is usually selected, yet, although the chances of its success are great, it generally results in the destruction of an inch or two of the urethra. A safer plan is to feel for the membranous urethra by a finger in the rectum. This portion of the urethra lies in the median line between the prostate and the anus. Having identified it, the surgeon makes a clean incision from the last recognizable part of the urethral roof downward (as the patient lies upon his back) until he opens into the membranous urethra. If these landmarks cannot be made out, it is better to do retrograde catheterization at once. A further precaution to be borne in mind is to cut only in the median line, and not to cut too deeply. The natural tendency is to cut through the canal and to search for the opening up towards the prevesical space.

If at any time the probe or director is thought to have entered the urethra, a female catheter should be passed alongside of it, and as this enters the bladder the urine flows. The operation is then completed as described above.

The Wheelhouse Staff (Fig. 55).—This instrument is for use only in external urethrotomy without a guide. It is inserted, groove down, and cut upon like any other staff. As soon as the urethra is opened, the staff is revolved until its bulb presents in the wound, and withdrawn until it catches in the anterior angle of the urethral incision. It is then used as a central retractor. I have not found it essential.

Retrograde Catheterization.—This operation is the last resource when the stricture cannot be opened through the perineum. The legs are let down and suprapubic cystotomy is performed (p. 459). Through this wound a sound is introduced into the urethra down to the posterior face of the stricture. Upon this the urethra is readily opened. Most urinary surgeons in this country pride themselves never to have performed retrograde catheterization; but in Europe, where external urethrotomy is less often done, retrograde catheterization seems to be resorted to quite frequently.

After-treatment.—The patient is placed in bed with hot bottles about him and stimulated as much as necessary. To the perineal tube is attached a long rubber tube leading into a bottle containing a known quantity of 2% carbolic-acid solution. This is emptied from time to time, and the amount of urine accurately noted. The tube remains in place four days, during which time the bladder is injected through the tube once or twice daily with boric-acid solution.

If cystitis is severe 1:8,000 nitrate-of-silver solution serves better. The dressings are changed as often as necessary.

On the fourth day the tube is removed, a full-sized sound introduced, and a few drops of 1:1,500 nitrate-of-silver solution injected along the urethra. This is repeated twice a week until the wound is healed, and then at longer intervals (p. 218).

After the removal of the perineal tube the wound is kept clean and covered with a pad. For the first few days there is incontinence, and all or nearly all the urine is passed through the perineum. But the incontinence ceases, and the urine comes to pass entirely through the penis during the second or third week. Ten days later the wound is healed.

Complications.—Hemorrhage, spasm, and infection are the three complications to be feared.

Hemorrhage usually does no harm beyond blocking the tube or filling the bladder with clots, thus exciting spasm. But I have known a man to bleed persistently from a perineal wound until his death was imminent. Alum injections stopped the flow after other astringents and packing had failed. The bleeding is usually free for the first day, after which it decreases rapidly.

Spasm of the bladder is excited by distention of the organ with clots or by obstruction or slipping of the tube. The spasm may also be set up by the mere presence of the tube or of packing in the perineal wound. Clots may be removed by repeated gentle injections and aspirations of hot boric-acid solution, or by replacing the tube with a litholapaxy tube and aspirator. The injection of hydrogen peroxid may do more harm than good. On the other hand, if the spasm is due to the mere presence of the tube, the patient should be kept under the influence of narcotics for the first twenty-four hours, and if spasm persists at the end of that time the tube must be replaced with a smaller one or removed entirely. In the latter event the frequent use of the catheter may be required.

Infection is the great danger. It may assume any of the forms of urethral or urinary fever. Our great safeguards are diluent waters and urotropin by the mouth, nitrate of silver locally, and the perineal tube. If the integrity of the kidneys is assured no septic complications need be feared. Unfortunately, the kidneys are often congested, or even infected, and the mere cutting may suffice to excite a urethral chill, in spite of the most minute precautions; but this chill will not recur if there is efficient drainage and the patient is flooded with water by mouth or rectum (p. 46).

To recapitulate: The points in external urethrotomy that require special attention are:

1. Perfect familiarity with the operative field.
2. Methodical deliberation at every step.
3. Plenty of light and a wide dry wound.
4. Preservation and recognition of the urethral roof.
5. Division of all bands and excision of all masses of stricture tissue, especial care being taken to free the roof of all ridges and to pass a full-sized sound.
6. Proper use of the perineal tube.
7. Intelligent after-treatment.

OTHER OPERATIONS

Sir Reginald Harrison,¹ instead of cutting deep perineal strictures from without, has devised a rapid method which he calls *combined external and internal urethrotomy*. It consists of an internal urethrotomy done with a Maisonneuve instrument upon the roof of the canal, followed by the introduction of a staff and a puncture in the perineum large enough to admit a perineal tube. This operation commends itself by its simplicity and rapidity for use in all cases where excision of cicatricial tissue is unnecessary. I believe it essential to introduce a finger into the bladder to be sure that the way is clear.

Certain other operations have been devised to minimize the scar tissue which remains after any urethrotomy, and whose practical persistence in deep strictures, and especially in traumatic strictures, sooner or later causes recurrence, unless sounds are used indefinitely. Of these operations the simplest is the *immediate suture of a lacerated urethra* (p. 38). In a similar manner, if a great deal of scar tissue is excised in doing an external urethrotomy, the divided urethral roof may be brought together by buried catgut sutures. For traumatic stricture the scar is often wholly excised and the urethral ends approximated. Developing along these lines a number of surgeons have applied *Thiersch grafts* to urethrae from which considerable lengths of scar have been removed. The inner layer of the prepuce has usually been called upon to supply the graft, but any skin upon which no hair grows does as well. The graft should be sutured to the urethral roof at each end and kept in place by packing. I have thus succeeded in filling a gap 1 inch long to the patient's entire satisfaction.²

Time has judged the use of *caustics* and condemned them, while the same fate awaits *electrolysis*. My experience with it has been unfortunate and my verdict pronounced.³

¹ Brit. Med. J., 1885, July 18th. ² J. of Cut. and Gen.-Urin. Dis., 1891, November.
³ N. Y. Med. J., 1871, xiii, 569.

SUPRAPUBIC ASPIRATION

When there is complete retention, either from stricture or from hypertrophy of the prostate, and the urethral obstacle is insurmountable, it is often expedient to relieve the patient by aspiration. This operation is absolutely simple and may be repeated a number of times. Not infrequently an impassable stricture will admit a filiform bougie after aspiration.

Any form of aspirator may be used. I prefer Potain's (Fig. 62). The needle should be of fine calibre and 2 inches long. The

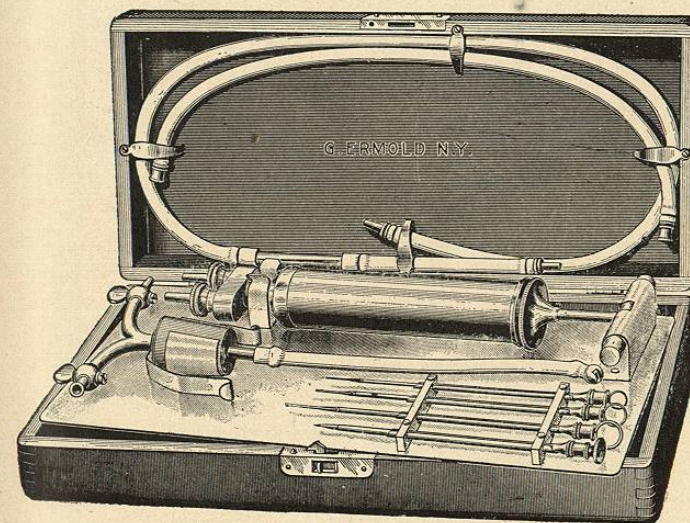


FIG. 62.—POTAIN ASPIRATOR.

pubic region is shaved and scrubbed with green soap, then washed with alcohol and ether. The needle is boiled and the rest of the apparatus rendered as clean as possible. While it is not necessary that the surgeon's hands be surgically clean, they should at least be washed. Immediately before inserting the needle its permeability and the efficiency of the aspirator should be tested.

The suprapubic region should be percussed; a flat note indicates that the distended bladder lies beneath with no loops of intestine intervening. The needle is plunged through the abdominal wall in the median line at a point about $\frac{1}{2}$ inch above the pubes. The aspirator is then attached and its piston withdrawn to form a vacuum. If no urine flows the needle is pushed in until some does. Then it is held stationary until the contents of the bladder have been drawn off. Only one other precaution need be observed—namely, to

maintain suction while the needle is being withdrawn. Unless this is done a drop of infected urine may be left in the suprapubic space and cause a prevesical abscess.

Aspiration through the rectum or perineum, and simple puncture without aspiration are dangerous operations, and should not be practised.

THE RETAINED CATHETER

The retained catheter (*sonde à demeure*) is employed for dilatation or drainage. For the latter purpose it is far less popular in America than abroad. We prefer external section and perineal drainage to internal section and catheter drainage for reasons to be given in the next chapter.

The Instrument.—Filiform, rubber, or woven bougies or catheters may be selected, *but no metal instrument should be tied in the urethra.* Within twenty-four hours a metal instrument will cause severe ulceration at the peno-scrotal angle, at the bulbo-membranous junction, and in the bladder, wherever its point rests. In general, the softer the instrument the better for the canal. Hence a new stiff-rubber catheter should be the surgeon's choice. If this cannot be introduced, a smooth woven instrument should be employed.

Self-retaining catheters of various designs may be employed. Pezzer's catheters are the most satisfactory. They have a flange which rests against the neck of the bladder. One form (Fig. 63) is for introduction over a mandrin through the urethra. The other (Fig. 64) is intended for retrograde catheterization. A sound is introduced into the urethra and brought out through the suprapubic wound. The catheter is fitted over its point and so drawn into the urethra.

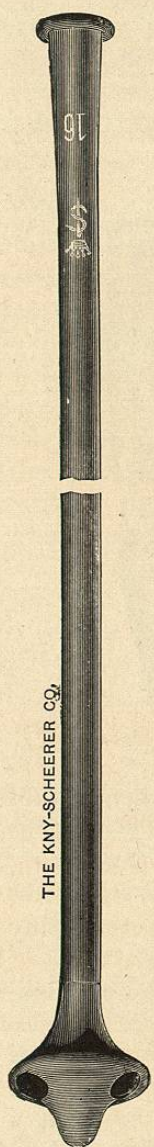


FIG. 63.—PEZZER SELF-RETAINING CATHETER.

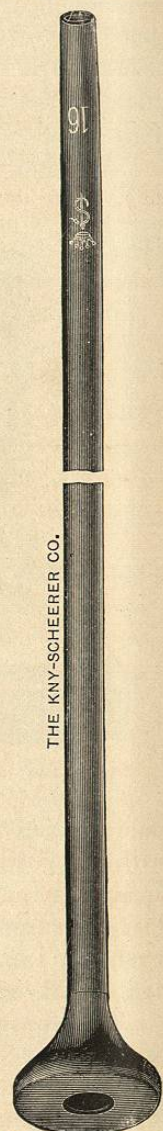


FIG. 64.—PEZZER SELF-RETAINING CATHETER FOR RETROGRADE CATHETERIZATION.

The instrument employed should fit loosely in the canal. Even when dilatation is aimed at, an instrument that fits rather loosely in the stricture will do more good than one that is introduced only with difficulty.

Introduction.—For dilatation the filiform instrument should only be introduced far enough to engage thoroughly in the stricture. It should be changed every twenty-four or forty-eight hours.

For drainage, if a self-retaining catheter is employed, it is placed with its collar resting lightly against the neck of the bladder. An ordinary catheter should be introduced until the urine flows through it, then withdrawn until the flow is cut off, then reintroduced $\frac{1}{2}$ inch, and there fixed. With the catheter in this position the surgeon may feel sure that the outflow will not be interfered with, nor will the point of the instrument make any undue pressure upon the floor or the posterior wall of the bladder. The catheter should be removed and cleansed at least twice a week.

Fixation.—Even when a self-retaining catheter is employed, it should be further guyed at the meatus. Several varieties of apparatus have been devised for this purpose, but none is more efficient than the following: A large flat bone button, with its centre cut out to fit snugly over the catheter, is slipped over it close up to the meatus. A piece of tape or coarse silk thread is then tied tightly around the catheter just beyond the button. The two ends of the thread are tied together at about 1 inch from the catheter, then carried around the corona glandis and again knotted, thus forming a collar too tight to slip over the glans, but not tight enough to strangulate it. This manœuvre is repeated with another piece of silk or tape carried in the opposite direction. The four ends are then carried back along the penis and bound to it by several turns of adhesive plaster, or tied to the pubic hairs.

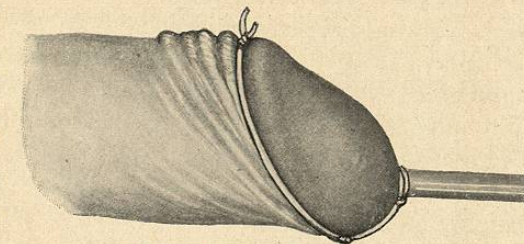


FIG. 65.—FILIFORM BOUGIE TIED IN.

To tie in a filiform no button is needed and only one strand of silk, the ends of which may be cut short after the corona has been snugly encircled (Fig. 65).

Dressings.—After the catheter has been tied in place a dressing of sterile gauze is wrapped about it and the penis, and the whole slung up over the groin by a T-bandage. If the instrument is used

for drainage it is then inspected. If the urine flows drop by drop the catheter is properly placed. Its end is attached to a tube leading over the side of the bed into an antiseptic solution.

Complications and Precautions.—Some patients cannot endure a retained catheter. It sets up continuous vesical spasm. The selection and proper introduction of a small smooth instrument will go far to overcome this in some cases, and, if necessary, the patient should be kept under the influence of morphin for twenty-four hours before the attempt is abandoned.

A purulent urethritis almost invariably results from the use of a retained catheter. It is due to the presence of the catheter, but in a sense is bacterial as well, since it is associated with and in part caused by a pullulation of the urethral bacteria. This urethritis usually produces few symptoms beyond a free discharge of pus from the meatus, and it subsides when the catheter is withdrawn; but if neglected it may lead to ulceration of the canal, and so increase the stricture. To minimize the urethritis a smooth clean instrument should be chosen and the anterior urethra irrigated by the Janet method before the introduction of the catheter, as well as every time it is changed.

Urinary fever and urethral chill may be unavoidable. But if the antiseptic precautions just laid down are observed, if the catheter is working properly, so that no fluid is allowed to accumulate in the bladder, and if urotropin is administered, the danger of septic complications is minimized. A single chill may be disregarded, but if, in spite of all precautions, the patient's condition gets worse instead of better, the catheter must be withdrawn.

Cystitis and stone may be avoided by cleanliness and frequent changing of the instrument.

CHAPTER XIII

STRICTURE OF THE URETHRA—PROGNOSIS AND TREATMENT

PROGNOSIS

ALTHOUGH the prognosis of stricture depends upon the treatment more than upon any other one thing, the progress of the disease varies according to the nature and location of the scar. Traumatic strictures often contract rapidly, in spite of all the surgeon's efforts. Gonorrhoeal strictures, on the other hand, contract far less energetically. Strictures of the perineal urethra are far more difficult to cure than strictures of the pendulous urethra. The latter contract slowly and are commonly curable; the former contract more rapidly and are, in the majority of cases, incurable—that is, they may be relieved by sounding or urethrotomy, but they usually relapse after a time. Finally, the more extensive a stricture the more irregular its surface, and the denser the cicatricial tissue composing it the more difficult will be its treatment and the more dubious its cure.

In the matter of life or death, however, the prognosis of stricture is far less gloomy. Stricture is not often fatal, except in neglected cases, such as are sometimes encountered in hospitals. Death occurs in various ways. Not to mention the rare cases of sudden death following the simple introduction of an instrument, and only alluding to rupture of the bladder and death following surgical operations for the relief of stricture, the causes of fatal termination in cases of stricture are three:

1. Extravasation of urine, which, if extensive, kills at once by shock, or, later, by exhaustion, suppuration, abscess, gangrene, or pyemia.

2. Chronic uremia, usually associated with septicemia, from the involvement of the kidneys in the inflammatory process. The patient may die from such a cause even after the stricture has been dilated; or, as is more commonly the case, the treatment itself, whether by sound or knife, may induce a reflex congestion of the diseased kidneys, which closes the scene.