retention of urine, overflow, dribbling, imperfect erection, irritability of the bladder, hæmaturia, impotence—from urethral obstruction to escape of semen. The *remoter results of stricture* are cystitis, with various inflammatory, functional, and structural changes in the bladder, ureters, kidneys, rectum, often terminating fatally; stone in the bladder, infiltration, perineal abscess, fistula, rupture of bladder, epididymitis, and sterility—from obliteration of the canal of the epididymis.

A word must be said here concerning the effect of the sexual element in aggravating the symptoms of stricture. This is especially true concerning all painful, neuralgic, and functional disturbances. An unmarried man frequently tortures himself with fancied ailments, which he ascribes to stricture; or declares himself strictured when the canal is sound, imploring sympathy and demanding energetic treatment. Fancied stricture, next to fancied spermatorrhœa, is a very common hypochondriacal expression of perverted sexuality, such as is found among those who heedlessly allow the brain to stimulate their erotic fancies and sexual needs, without being able to set Nature at rest by satisfying her demands, or who, on the other hand, abuse themselves sexually by physical as well as intellectual excess.

These patients require kind and gentle management. They must be put right about the cause of their troubles, and their sexual hygiene must be regulated. This can be accomplished only by marriage, or by purity of thought and absolute continence.

CHAPTER VIII.

TREATMENT OF STRICTURE OF THE URETHRA,

With Details for all Complications, and a Recapitulation.

The treatment of stricture of the urethra, and of its results, may be considered under three heads:

1. *Treatment of Uncomplicated Stricture—*
   - (*a.*) Of Large Calibre.
   - (*b.*) Of Small Calibre.
   - (*c.*) Of the Meatus.
   - (*d.*) Traumatic.
   - (*e.*) Resilient—often irritable.
2. *Treatment of Stricture complicated by—*
   - (*a.*) False Passage.
   - (*b.*) Retention.
   - (*c.*) Retention—the Stricture being impassable.
   - (*d.*) Infiltration.
   - (*e.*) Abscess.
   - (*f.*) Fistula.
   - (*g.*) Peri-cystitis.
   - (*h.*) Enlarged Prostate.
3. *Treatment of Fistula with Loss of Substance.*

1. Treatment of Uncomplicated Stricture.

(*a.*) *Of Large Calibre.*—The majority of strictures which the surgeon is called upon to treat are of large calibre. The symptom of which the patient complains is persistent gleet, following gonorrhœa, or bastard gonorrhœa, with, possibly, some frequency in urination. These cases are of daily occurrence and often pass unrecognized, the gleet being treated, the stricture overlooked. Too much stress cannot be laid upon the importance of exploring the urethra, in such cases of gleet, with the bulbous bougie. One, two, or more strictures are found, the smallest, which is probably the deepest, allowing passage, perhaps, to a No. 9 bulb.

Treatment here is most simple. After the diagnosis has been made, no further instrumentation is advisable (if the patient can spare the time), until the effect of exploration has been observed. The chances of urethral chill, after first examinations, must be remembered. The patient's general condition and habits must be studied, and his urine tested for acidity, or possible kidney-disease. He must be instructed in urethral hygiene, and the nature of his malady explained to him, and he should be informed at the outset, to forestall future disappointment, that, after his symptoms have been removed by treatment, the permanence of his cure will almost certainly depend upon his own regular and intelligent use of an instrument upon himself at proper intervals, with the view of preventing tendency to recontraction of his stricture.

Being instructed not to mind the smarting at his next urination, and given such alkali, balsam, or injection, as the acidity of his urine and amount of discharge seem to call for, the patient is dismissed, to return in two days, to have his treatment commenced. The only treatment which gives satisfaction in the majority of these cases is dilatation with the conical steel sound. One of these instruments properly warmed is introduced in the manner already detailed (p. 32). Its size should correspond to that of the bulbous bougie, which has passed the stricture, and the utmost delicacy, care, and gentleness, should be used in its introduction. The wedge and lever should not be forgotten, nor should we abuse power because we possess it. At the strictured and tender points a spasmodic contraction may occur, arresting the instrument. To overcome this, patience is better than force. As soon as the instrument has entered the bladder it should be at once gently withdrawn. Nothing is gained by leaving it even for a moment. During withdrawal the

stricture is usually felt to "grasp" the sound. This "grasping" is the result of muscular spasm provoked by the presence of the instrument. It will sometimes relax if the sound be allowed to rest a moment. After one sound has been withdrawn, a second and even a third may be introduced, if it is considered safe. No rule, nothing short of personal experience, can indicate how far the dilatation may be pushed at one sitting. The tendency is always to hurry and to use force; a course detrimental to rapid progress. It may be stated as a rule, subject to judicious exception, that *if a conical steel instrument of any size larger than No. 9 will not enter a stricture by its own weight after a little delay, when held in proper position, it should not be used.* Every urethra, however, has its own temper, as it were; some are aroused by the slightest disturbance, while others will bear considerable violence without protest. A surgeon should acquaint himself with the temper of a given urethra by gradual experiment, before he takes liberties with it. The mischief to be feared from the employment of large sounds with force, besides false passages, which are not apt to be produced by large instruments, is threefold—

1. The production of epididymitis, a common result of violence to the urethra and a complication, which suspends treatment and confines the patient for several days or, it may be, weeks.

2. The excitement of inflammation in the stricture, which aggravates its condition and defeats the end of the treatment employed.

3. The production of chill and urethral fever.

In rare instances epididymitis may come on in spite of care. The complication must be properly attended to, and all treatment of the urethra suspended until the pain in the testicle has nearly subsided and the swelling of the epididymis has assumed an indolent character. It is not necessary to wait for the latter to disappear entirely, and, if extra care be employed in resuming the use of instruments, there is little danger of provoking relapse. While using instruments in the urethra, especially at the beginning of a course of dilatation, the patient should be advised to wear a suspensory bandage to keep the testicles from exposure to injury, which would render them more liable to epididymitis.

At each subsequent visit of the patient, the surgeon commences with a sound from one to two sizes smaller than the last instrument introduced at the previous visit, and carries the dilatation as far as possible, without the employment of force—this till the full size is reached.

The most important feature in the treatment of stricture by dilatation is, a proper regulation of the intervals to be allowed between the sittings. The intervals usually recommended are too short. Occasionally we see patients who attempt to treat themselves, introducing a bougie into the urethra daily, or twice daily, perhaps at every act of urination, aggravating every symptom, worrying the urethra and bladder into a state of inflammation, and wondering why the stricture does not get

well. Some surgeons, unfortunately, are guilty of the same error in a less degree. To solve the problem of the proper interval for reintroducing a sound through a stricture, it is only necessary to study the effect of a single introduction.

Suppose a stricture which sensibly diminishes the size of the stream of urine, and is attended by gleet. Through this stricture a conical instrument is introduced, which is arrested for a moment, but gradually passes, stretching the stricture, and is distinctly "grasped" as it is being withdrawn. What follows such an operation? At the next act of urination the stream is larger, and continues so during twenty-four hours. At the end of this time the stream is nearly as small as it was before the sound was used; the gleet is the same, or possibly increased. Now, for twenty-four to forty-eight hours the stream steadily becomes smaller, while the discharge grows more abundant and creamy. During the third or fourth day, improvement commences; the stream again grows larger, the discharge becomes thinner and less copious, and this improvement often continues through the fifth and sixth or even seventh days, or longer—after which the volume of the stream commences to diminish and the discharge to become thicker.

In such a case, if the same conical instrument first used had been reintroduced at the end of twenty-four hours, it would have passed the stricture with about the same facility as on the day before; if after forty-eight hours, it would enter with more difficulty; if at the end of seventy-two hours, it would again enter as easily as on the first day; if reintroduction were first attempted on the fourth day, the sound would pass more easily than at first; if on the fifth, with more ease still, and it would not probably be so tightly "grasped" on withdrawal; while in some cases the greatest ease of reintroduction is attained on the sixth, seventh, eighth day, or even later. This varies in different cases; but it may be stated, as a rule, *that it is bad surgery, in treating stricture by dilatation, to reintroduce an instrument—unless it be filiform—before the lapse of at least seventy-two hours, and that more rapid progress will be made with the case by waiting till after ninety-six hours—often even until the sixth, seventh, or eighth day.*

The reason for this rule becomes clear upon studying the therapeutic effect of pressure upon stricture-tissue. The first effect is mechanical (stretching) and sedative (quieting muscular spasm at the strictured point); this lasts twenty-four hours. The next effect is reactionary (congestive and spasmodic), resulting in extra tightness of the stricture and increase of discharge; this lasts from twenty-four to forty-eight hours. The final curative effect is absorptive. Absorption is excited by the increased activity of the circulation about the stricture, and continues for two or three days, or longer; after which, contraction and growth of stricture-tissue recommence. It is just at the period where absorption ceases and recontraction commences, that a

dilating instrument can be reapplied most effectively, and this period is, in the majority of cases, on the fifth to the eighth day. In brief, *intervals of a week, especially in cases of old stricture, are generally more beneficial than any shorter period.*

That absorption takes place during the cure of stricture by dilatation may be proved during life by examining the hard cartilaginous bands often found surrounding the urethra, and constituting stricture. These bands can be distinctly felt, over an instrument introduced through the stricture, and, during the treatment, they may be observed to become gradually smaller, until they become almost imperceptible. They rarely disappear entirely.

As to the degree of dilatation which is to be aimed at, every urethra has its own gauge in the size of its meatus—provided that meatus be not congenitally small, or contracted by disease. If there is any cicatricial tissue in the circle of the meatus, or if a probe can make out any pouching below the lower commissure (Fig. 53), the meatus is strictured, and requires treatment.

The normal meatus, however, is the smallest part of the healthy canal, and the object in view is, to bring all available pressure to bear upon a morbid narrowing of some other portion of the tube. To do this the meatus must be put lightly upon the stretch. When the meatus is stretched, the feeling is one of discomfort, which subsides after the instrument has been in place for a moment. If the meatus is over-stretched, a distinctly-marked, narrow, white line will be seen encircling the instrument upon the lips of the urethral orifice, indicating that the latter have been deprived of blood by pressure. So much distention is unbearable, but the greatest amount short of this should be aimed at. The average size of the adult urethra is No. 16, while 20 not unfrequently passes with ease.

As soon as a full-sized instrument will slip through a stricture by its own weight, all symptoms will usually have ceased, unless the stricture be very resilient; but recontraction will inevitably take place, and the symptoms return in time, unless the cure be maintained by the patient. This is easily done, and no intelligent patient objects to it. He acquires the art of gently passing a sound upon himself in a few lessons, and he should be seriously cautioned to perform this trifling but important operation at first weekly, then fortnightly, then monthly, studying his own case to determine how long an interval he can allow without sensible recontraction of his stricture. In this way, in some cases, the use of instruments may be gradually abandoned; in the majority it will have to be continued indefinitely, at intervals varying from a week to several months. In this way does the cure become radical. The surgeon is responsible for the cure only on condition that the patient carries out this plan; or, rather, the patient is responsible for the permanence of his own cure, and this he must be made distinctly to understand.

(*b.*) *Stricture of Small Calibre.*—To this class belong strictures admitting any instrument less than No. 9. They are arranged under a special head, not because they require different treatment, but in order to emphasize the fact that by far the greater number of such cases are better treated with soft than with steel instruments. The danger of making a false passage in an obstructed urethra with a small metallic instrument cannot be overrated. No one can appreciate the ease with which false passage is made, until he has himself made one. Indeed, it is not very uncommon for a patient or surgeon, not well acquainted with the urethra, to make a false passage, and go on dilating it instead of the stricture, wondering meantime that the size of the stream is not increased or the symptoms alleviated. A surgeon who knows every line of the urethra may occasionally assume the risk of using a small metallic instrument in the canal without a guide, but only in exceptional cases. Below No. 9 soft instruments only should be employed, unless there be a guide through the stricture.

Dilatation is carried on as already directed, steel instruments being used as soon as the stricture will admit 9. Progress is slower with soft than with steel instruments; they usually give the patient more pain; the intervals between their introduction may be somewhat shorter.

Cutting (internal urethrotomy) and stretching (divulsion) operations are growing daily in favor in the treatment of strictures of small calibre; yet, in a case of uncomplicated stricture, no matter how tight it may be, provided it does not prove resilient, and is not of traumatic origin, if any instrument at all can be passed, dilatation is still the best method of treatment. Scarification and divulsion are only helps. They are attended by danger. They do not cure radically. The sound must be used after them. When pursued with gentleness and care, the patient need not lose a day from business on account of treatment by dilatation, nor be confined an hour to the house; while the risk of exciting complications is at a minimum. The treatment is longer surely, but, if the surgeon will imagine what would be his own wish were he in the patient's situation, he will not hesitate to adopt the safer but more tedious method.

For the class of strictures (uncomplicated) now under consideration, exception may be made in favor of divulsion or internal urethrotomy in two classes of cases:

1. If the patient cannot give enough time to carry out dilatation properly.

2. If pretty severe urethral fever follows attempts at dilatation (Case XI.).

In commencing the treatment it may be impossible to enter the bladder with any instrument, either on account of the tightness of the stricture, or because the point of the instrument does not engage in the

latter, or is arrested by some fold or lacuna beyond. In these cases gentle perseverance and skill will rarely fail of success. The different varieties of filiform bougies, with the different manœuvres and expedients of introduction already detailed (p. 104), rarely fail to triumph over all difficulties. Sooner or later the bladder is reached,[1] and the case is under control. On the third or fourth day the same filiform instrument will pass with greater facility, and a larger one will usually follow: the treatment by dilatation is fairly under way.

In those exceptional cases just alluded to, where a filiform bougie only can be introduced after long and persevering effort, it becomes a serious question whether it is not better to utilize the guide thus introduced through the stricture, to conduct another instrument upon it, rather than to run the risk of retention from swelling of the stricture after the guide has been removed, and perhaps incur the necessity of operating under less favorable circumstances. The temptation to operate in these cases is great, but the necessity for it is often more apparent than real. True, if the stricture be very tight, retention may result from disturbing it, especially if the urine be acid, but this retention yields to heat and opium, or the same filiform instrument, which caused the trouble, may usually be reintroduced; finally, the aspirator might be used: in any case, after seventy-two hours, a larger instrument will rarely fail to pass, and dilatation has commenced to effect a cure. Hence, in all these cases, where the patient can afford the time, dilatation is the preferable, because the safer, treatment.

In the so-called impassable stricture (uncomplicated), where urine passes out, but no instrument can be made to enter the bladder, a filiform bougie can invariably, with patience, be inserted into the orifice of the stricture. That it has entered is known by the "grasping" of the instrument by the stricture. If now the bougie be left engaged during eight or ten minutes, the muscular spasm constituting the "grasp" may yield and allow it to advance; if not, another attempt may be made in twenty-four or forty-eight hours, when, if it will not pass, it will at least enter the stricture to a greater depth; finally, skill will overcome it and the surgeon advances to higher numbers. Model bougies are useless. Whalebones are superior to all other means.

In any of the above cases, if, after sufficient deliberation, it is decided to enlarge the stricture before withdrawing the guide, a choice of operations must be made. If it is only intended to enlarge the stricture sufficiently to make its entrance by a dilating instrument more easy after a few days, if the guide be a soft filiform bougie furnished with a screw, a larger bougie or silver catheter may be screwed into it, and the compound instrument carried into the bladder; or, if the guide,

[1] In one (personal) case it required ten sittings, most of them over one hour long, before any instrument could be made to enter the bladder. On the tenth effort, the instrument passed. I entered the bladder and at once divulsed the stricture. In two weeks the patient passed his own full-sized instrument.—KEYES.

as is usually the case, be a whalebone bougie, a tunneled sound may be slipped over it and gently but firmly carried through the stricture, a little force being used, but at the same time great care taken not to bend the guide in front of the advancing instrument (p. 104).

If it is intended to relieve the stricture at once, the broad rule is—*all strictures of the pendulous urethra, if operated upon, should be cut; all strictures of the fixed urethral curve should be divulsed*—unless external section is necessitated by circumstances. Bleeding from the pendulous urethra can always be controlled by direct pressure; not so easily that from the bulb or membranous urethra. The operative procedures have been detailed (Chapter VI). As for the result of these operations, either of them will afford immediate relief; shock seems to be about the same in either case; neither will effect a radical cure, and that one is to be preferred which is most convenient and attended by the least pain and danger. This operation is divulsion with Thompson's instrument.

If a stricture of the pendulous urethra is so small as to require immediate radical measures, it should first be stretched by Thompson's divulsor on a guide, until it will admit Civiale's urethrotome, or Maisonneuve's urethrotome may be used at once.

(*c.*) *Stricture of the Meatus.*—Stricture at or very near the meatus is usually made worse by attempts at dilatation beyond a certain limit, after which it becomes irritated, inflamed, and refuses to dilate. To a still greater degree is this true of congenital or cicatricial narrowing of the meatus. In all of these cases, the contraction must be cut with Civiale's concealed bistoury, scissors, or knife, toward the floor of the urethra alongside of the frænum. The orifice should be cut a little larger than it is estimated to have been the original intention of Nature to make it, since slight contraction necessarily takes place in healing. Hæmorrhage, in this operation, is considerable, if the corpus spongiosum be cut into. It may always be arrested, as already described (p. 120).

Reflex irritation may produce spasmodic stricture in these cases, so that the next attempt to urinate is perhaps ineffectual. Removing the collodion, dipping the penis in warm water, and reassuring the patient, will invariably bring a flow of urine. A meatus, properly cut, remains open indefinitely, without the necessity of dilatation.

Where the narrowing of the meatus depends upon an extensive cicatrix, left behind by soft chancre or other ulceration, and where meatotomy is unable to keep off subsequent gradual recontraction, the operation of Colles[1] should be substituted for simple incision. This consists in dissecting off whatever parts of the frænum or prepuce remain attached, and slitting the floor of the urethra for half an inch. The mucous membrane of the canal is now dissected up on both sides, a portion of corpus spongiosum is cut away, and finally the mucous membrane is attached laterally on either side by points of fine suture.

[1] "Practical Observations on the Venereal Diseases," London, 1837.

(*d.*) *Traumatic Strictures* are not usually amenable to treatment by dilatation. They are so exceptionally tough, hard, and retractile, that a splice or splices must be put into them, by rupture or section, in order to keep them open. Since the days of Syme, it has been customary to consider perineal section indicated, wherever stricture of the membranous urethra was of traumatic origin. This rule has ceased to hold good since the improvement of urethral instruments. On the contrary, it may be affirmed that permeable uncomplicated traumatic stricture is best treated by divulsion, if it be deep-seated in the urethra, by internal incision, if it occupy the pendulous portion of the canal. The following case shows the toughness of traumatic stricture, and substantiates the above assertion:

Case XXI.—A healthy farmer's boy, of seventeen, was brought to New York in June, 1869, for relief from retention, with overflow. Two years previously he had injured his perinæum by a fall upon a board. Gangrene followed. When the slough separated, his physician saw "both ends of the urethra separated by more than an inch." Sounds were passed at first, but, after six months, the patient ceased putting the instrument into his bladder. At date of application, no instrument had entered the bladder for eighteen months. A week previously, the patient had complete retention. He was then etherized by his physician (Dr. Case) for the purpose of operation. Under ether, the bladder partially emptied itself, and nothing was done. Overflow continued; there was not much cystitis; the patient was brought to New York for operation.

After careful manipulation, without ether, for two and a half hours with all varieties of instruments, Thompson's probe-pointed catheter was at last passed into the bladder, by the exercise of some force, and clear water flowed through it. Not a drop of blood flowed during the two and a half hours' manipulation. The instrument was withdrawn, and a similar one of larger size passed. This was followed by Thompson's divulsor without a guide, a strong instrument, selected by Thompson himself, manufactured by Weiss. This was screwed up, *but broke at* 15. It broke just where a properly-made instrument always does, if it break at all, one blade snapping just where the two are joined. The stricture, however, fortunately cracked just as the instrument gave way. The divulsor was withdrawn without trouble, and a No. 14 conical steel sound introduced into the bladder. On the following day, a full-sized (15) sound passed easily, and the patient started for his home (one hundred and fifty miles distant), where he arrived safely. His physician, who was in New York two years later, stated that the patient had continued perfectly well, introducing No. 15 every week.

Here was a stricture as dense and hard as it was possible for a stricture to be—hard enough to break an instrument of the best make—yet cured by divulsion.

As a general rule, however, if the rigidity and extent of stricture be particularly great, if it be complicated by numerous or large fistulæ, or if the stricture be impassable, it is advisable to operate externally, as this gives the surest chance of relief.

(*e.*) *Resilient Stricture.*—Strictures which are thoroughly resilient will not dilate (Case XV.). In such cases, if a given instrument be introduced, the stream becomes smaller at once, and on the fourth day the same instrument enters with more difficulty, or perhaps will not pass at all. These strictures are frequently irritable as well as resilient,

and always demand divulsion, with the employment of enough force *to crack the stricture*, or internal urethrotomy.

Many strictures, however, which respond to dilatation at first, fail to do so after they have reached a certain size. To this class belong all strictures at or very near the meatus, and many at other portions of the canal. In these latter cases, although a full-sized conical sound may readily pass, yet a bulbous bougie, many sizes smaller, introduced immediately after the withdrawal of the sound, is arrested by the stricture, while the symptoms (gleet, etc.) fail to disappear entirely. In these cases Otis's divulsing urethrotome is the best instrument to use, to put a splice into a stricture which has received all the benefit dilatation could give it, without being made quite large enough.

2. Treatment of Stricture complicated by—

(*a.*) *False Passage.*—False passage, as already stated, results from rough or unskillful use of small instruments in an obstructed urethra. It may be due to "forced catheterism," a barbarous procedure, con-

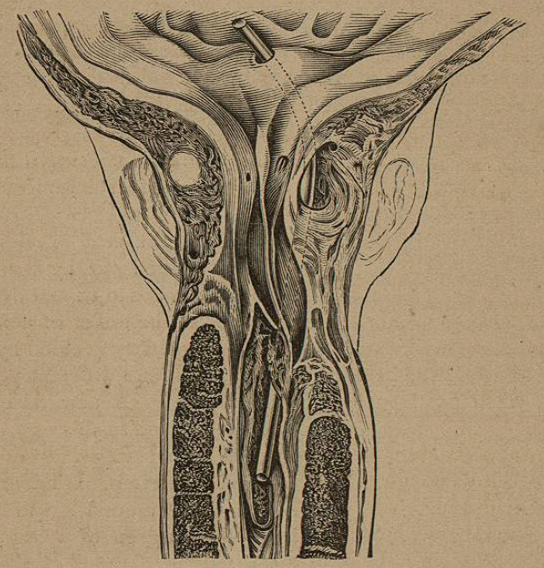

Fig. 55.—(*Dittel.*)

demned by its name alone, which consists in passing a metallic catheter up to the obstacle, and then forcing it along in the supposed course of the urethra, until urine flows through it, if haply this occur at all. It is not used at the present date. False passages start from the bottom of lacunæ (Fig. 30), from the front face of a stricture, from in front of the triangular ligament, or from some abscess (Fig. 55). When a surgeon