CHAPTER VII.

STRICTURE OF THE URETHRA.

Diagnosis.—Use of Bulbous Bougie.—Symptoms of Stricture and its Results as affecting the Urethra, Bladder, Kidneys, Testicles, Rectum, Nerves, etc., including a Consideration of Infiltration, and the Harmlessness of Healthy Urine in contact with the Tissues.—Causes of Death from Stricture.—Recapitulation of Symptoms and Effects of Stricture.

Diagnosis.—Few morbid conditions of the body are more easy of diagnosis than organic stricture of the urethra. To examine for stricture, a bulbous bougie is selected of the largest size that the meatus will admit. It is oiled, introduced, and passed gently down the canal. If it goes on unobstructed into the bladder, there is no stricture; otherwise there is, for the meatus is the smallest part of the normal canal. When the instrument is arrested by an obstruction, it should be seized with the thumb-nail and fore-finger at the meatus and withdrawn. The distance between the bulbous point and that part of the shaft seized by the thumb-nail (measured on the side of the scale-plate) indicates the distance of the stricture from the meatus. Smaller bulbous bougies are now tried, until one is found which will just pass through the stricture. This indicates the calibre of the contraction. After the bougie has passed into the free canal beyond, it should be retracted until its shoulder is arrested by the stricture. Now the thumb-nail is again placed at the meatus upon the shaft of the instrument, and the whole withdrawn and measured. The difference between the two measurements will give the length of the stricture. Having localized and studied out one stricture, a bulbous bougie which will pass through it is employed, in the same manner, to search the canal beyond, it being a rule, with few exceptions, that where several strictures exist the calibre of any one is smaller than that of all the others between it and the meatus, and larger than that of all deeper-seated contractions.[1]

These bulbous bougies will detect tender places in the urethra, where no thickening exists, and will easily appreciate slight diffuse thickening of the urethral walls, not yet sufficiently defined to be pronounced stricture of any given length. Occasionally, in a sensitive, irritable urethra, the head of the bulbous bougie will be stopped by a muscular spasm of the canal, but this rarely except at congested, sensitive spots, or by contraction of the muscles surrounding the membranous urethra. Gentleness and a little delay will usually overcome this kind of obstruction,

[1] If the bulb is arrested lower than six inches, it is suggestive of enlarged prostate, especially in patients beyond fifty-five.

and, after the instrument has passed the constricted part, and an attempt is made to withdraw it, the spasmodic, muscular nature of the constriction can be easily appreciated. The muscles will be felt to "bite" the instrument, quiver a little, then suddenly let go and recontract. In cases of doubt a blunt, full-sized, well-warmed and oiled steel sound should be passed down to the obstructed point and gently pressed against the obstacle to tire out the muscles, which, after a few minutes, will suddenly relax and the instrument will glide rapidly into the bladder, unless other obstacles exist.

Stricture of the meatus may be predicated whenever the orifice is seen to be involved in a cicatrix, or whenever a probe introduced within it can demonstrate a distinct pocket behind the superior or (more commonly) inferior commissure of the orifice (Fig. 53).

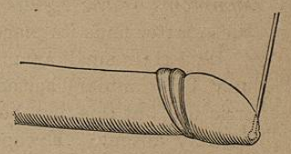

Fig. 53.

Care must be exercised not to confound lacunæ, which catch the points of small instruments, with stricture.

The endoscope and model bougies will not give any information which may not be obtained more easily by the means above detailed:

Symptoms and Results of Stricture.—Stricture may exist for years without giving rise to a single symptom of sufficient importance to attract the patient's attention. In fact, it may be said that stricture has necessarily no symptoms until it has become so tight as to sensibly obstruct the outflow of urine and semen, or has been attended by so much callous overgrowth as to interfere with the flow of blood through the meshes of the corpus spongiosum. A man may have stricture of small calibre of any part of the canal, but especially of the meatus, and yet never suffer from it in any way until adult life—perhaps never at all; but this is exceptional.

Case XVIII.—A young married man, of twenty-four, a Jew, applied for relief of a very considerable degree of irritability of the bladder, which had been coming on for some time, the desire to urinate recurring as often as every hour. On examination, it was found that his meatus was involved in a smooth circular cicatrix. Being questioned as to the origin of this scar, the patient declared that he had always had it, and had considered that it was natural. He had never had any wound or ulcer upon his glans penis. It was subsequently ascertained that the wound had been made by the knife of the priest when the patient was circumcised upon the eighth day after birth, according to the Jewish rite. The stricture of the meatus caused by the healing of the wound had never given rise to any symptom until adult life, and then the only symptom was a frequent and urgent desire to urinate. The stricture was treated by incision, and the bladder-symptoms quickly subsided and remained cured.

Case XIX.—A healthy married gentleman, of forty-two, applied for treatment of frequent urination. He passed water from fifteen to twenty times daily, but was not troubled at night. When watched, he could not urinate at all. The meatus admits No. 8, and has a pocket behind the lower commissure. This was slit, and No. 15 passed at

once. After the operation the calls to urinate recurred but five times daily. The meatus healed in a few days, admitting No. 17 without stretching.

In this case the meatus was occluded by a thin duplicature of mucous membrane, which, when cut, scarcely bled. The patient has never suffered from this narrowing until now—his forty-second year. A lawsuit, full living, and excessive smoking, were the immediate exciting cause of the appearance of symptoms. Instant relief followed the re-establishment of the full size of the canal.

This case demonstrates the value of looking for the "pocket" at the lower commissure in obscure cases of bladder-disease, where there has been no antecedent local disorder.

The symptoms usually described as those of stricture are mainly the *symptoms of the results of stricture*, and consequently a description of these latter finds its place here.

A certain small amount of gleety discharge from the congested (or it may be granular) surface usually accompanies the forming stage of stricture, but this may be so slight as not to attract attention, or may be entirely absent. Exceptionally urethral or other neuralgia depends upon stricture in the forming stage (Case XIV.).

The results of stricture are mainly mechanical in the first place. The strictured portion is less dilatable than the rest of the canal, and acts somewhat like a dam. The urine coming down with great force, and striking against this unyielding bar, tends to dilate the urethra behind it (Fig. 54), and this directly in proportion as the stricture is slow in forming, and dense in structure. If more than one stricture exist, the urethra may be dilated between them. This stretching process tends to dilate the mouths of all the ducts opening into the urethra behind a stricture. In this way the sinuses and mouths of all the follicles become enlarged, and capable of entrapping the point of a fine instrument. This is also true of the ducts in the prostatic sinus, which may become so pouched out that the floor of the prostatic urethra becomes reticulated, and composed entirely of depressions, separated by thin fibrous partitions—these latter representing

FIG. 54.—Taken from a pathological specimen, showing stricture of membranous urethra, with dilatation behind it, hypertrophy of bladder, dilatation of ureters, pelves of kidneys, etc.

what is left of the tissue which existed originally between the ducts of prostatic follicles. The ejaculatory ducts may be distended in the same way; as may also, though rarely, the seminal vesicles—the urine being forced back into them.

The force exerted laterally by the urine propelled through the urethra by the contracting bladder is much greater than is generally supposed. To understand this, it is only necessary to call to mind the hydrostatic paradox, which demonstrates the equal pressure of fluids on every square line of surface with which they come into contact. This forcible stretching of the mucous membrane behind the stricture at every act of micturition, although only slight in extent at first, weakens the tone of the stretched portion of the canal, congests it, and leads to the formation locally of an excess of mucus. If the urine be acid and irritating, these effects take place all the more rapidly. Soon a drop of urine is retained behind the stricture in the dilated portion of the canal, the mucus acting upon it as a ferment alkalinizes and decomposes it, liberating carbonate of ammonia. This acts upon the stretched urethra, and produces inflammation. This mild inflammation behind stricture is very constant. It furnishes the gleety discharge, or the morning drop of muco-pus, which glues the lips of the meatus together.

The gleet of stricture gets better or worse according to the general condition of the patient, the degree of acidity of the urine, and the amount of sexual indulgence or venereal excitement. Exacerbations of gleet from slight causes, or repeated attacks of gonorrhœa, as the patient usually considers them to be, often constitute the most marked feature of the case, in a patient with stricture. In fact, it is the rule in mild cases that the patient is wholly unconscious that his urethra is at all narrowed. He applies for treatment, on account of his gleet, for an attack of gonorrhœa, as he calls it (bastard gonorrhœa, p. 56), and often refuses to believe that he has stricture, or that, if stricture does exist, it is of enough importance to occasion his symptoms; and he repeatedly asserts that he makes as large a stream of urine as ever. Nothing so well as the bulbous bougie will convince such a patient of his condition. The evidence of this instrument he must admit. The gleety discharge, once commenced behind the stricture, rarely ceases entirely until the constriction has been relieved. The same discharge will be seen in the urine in the shape of small, stringy shreds, formed of pus-corpuscles which have been washed off from the congested surface behind the stricture, and rolled into threads on their way out of the canal. These shreds may be all caught in the first gush of urine, what follows being perfectly free from them. When these white filaments are seen settling down in a glass of urine freshly passed, they constitute strong presumptive evidence of the existence of stricture; they may be due to other lesions.

As the stricture tightens, fresh symptoms are added. A cartilaginous

hardness may often be felt from the outside of the urethra at the constricted point. The meatus urinarius looks blue and congested, as does sometimes the whole glans penis, from obstructed circulation. The gleet continues, the stream of urine is small, often forked or curving up in a curious manner just after leaving the meatus, or there may be several streams running in different directions, or oftener one stream is projected for a certain distance, while the other drops down perpendicularly from the end of the penis. The last few drops of urine are retained in the canal, both mechanically by the obstruction of the stricture, and because the wave of blood, impelled by the contraction of the accelerator urinæ upon the bulb in the final effort at clearing the canal, cannot pass along the corpus spongiosum, on account of the obliteration of its meshes at the point of stricture, and thus fails in its function of expelling the last few drops of urine from the canal. By this same obliteration of spongy tissue, erection is sometimes rendered imperfect and painful.

The surface congestion of the stretched urethra behind the stricture in time extends backward to the bladder, and brings on irritability (so called) of that organ. The intervals between the acts of micturition grow shorter and shorter, and symptoms of mild cystitis appear. This *frequency of micturition* is the symptom of stricture, *next to gleety discharge*, which is least often absent. A slight narrowing of the canal may occasion it, as where the meatus is congenitally small, and it may come on with any stricture, as pure irritability, undoubtedly attended by congestion about the neck of the bladder, but not necessarily by any true cystitis.

The congestion of the urethra behind a stricture easily becomes greater, is kindled into positive inflammation by dining out, a little excess in drink, or a chilling of the legs; the mucous membrane swells up, the stricture closes, and the patient has retention of urine. If this retention is unrelieved, the bladder becomes overstretched; after many hours a few drops of urine will escape from the meatus (overflow), and the patient thinks he is getting better. If this condition of overdistention is allowed to continue unrelieved, the contractile power of the bladder may be permanently injured (atony). *Retention may be the only disagreeably prominent symptom* connected with a case of stricture. The gleet may not have been noticed, the gradual decrease in the size of the stream may have been ignored, when, after exposure, excess, a carouse of beer, retention suddenly comes on. Some patients will have had several attacks of retention before they apply for relief. The spasm and inflammation which caused the narrow canal to become obliterated in these cases cease after a few hours, and then the patient goes on perhaps for a year or more, without having another retention, not suffering noticeably in the mean time.

If retention does not come on, the inflammation, once aroused behind

stricture, gradually, sometimes rapidly, travels back through the prostatic urethra into the bladder, and we have cystitis of the neck. Now commences what was before absent, or, if present, only to a mild degree, a frequent desire to pass water, at first every three or four hours, once at night, and gradually at shorter and shorter intervals, until, when the patient seeks relief, he may be passing water in a fine stream every half-hour or fifteen minutes, with great pain and straining.

Blood sometimes flows with the urine at the beginning or end of the act. *Hæmaturia* may be, exceptionally, the most prominent symptom of stricture, indeed the only one noticed by the patient for a long time, as in the following case:

Case XX.—In December, 1871, ——, aged twenty-seven, came complaining of passing blood and having stricture. He had been married for six years, but his wife had not become pregnant. Twelve years previously had occurred his only gonorrhœa. It was attended by hæmaturia, and got well in a month. Slight gleety discharge soon reappeared, and has continued in greater or less amount ever since. In the autumn of 1869, while perfectly well and at work, he noticed that his urine was bloody. He had no pain at the time, and did not know that his stream was smaller than usual. From that time to date he has never passed water untinged with blood; often, to the unaided eye, it looks like pure red blood. He was treated medically, and finally for stricture, by the introduction of small instruments (up to No. 9), but all to no purpose. His stream became noticeably smaller; he was obliged to pass water every hour, several times a night, but the urine was not decomposed or ammoniacal, and contained no appreciable amount of pus. He felt weak from loss of blood, but had absolutely no pain. The amount of blood in the urine varied from time to time, but from no appreciable cause. He stated that he used to pass large clots as big as his thumb at about the middle of the stream. These evidently formed behind the stricture, but were not able to squeeze through it until "the middle of the stream," when the force of the current was greatest and the dilatation most positive. Sexual power was unimpaired, the orgasm perfect, but no semen issued at the time. It dribbled away afterward. A hard, callous stricture was found to exist at six inches, admitting a No. 5 bulbous bougie.

A filiform whalebone guide was introduced, over this Thompson's divulsor, and the stricture was stretched to No. 17; only a little blood followed; after a week No. 16 was passed quite easily. The patient's intervals of urinating were twice as long after the operation, and the amount of blood passed uniformly small. His meatus was cut, and finally No. 21 passed, but still the bleeding continued, the urine often looking like pure arterial blood, and the patient remaining blanched and unable to work, although passing a full stream at two or three hour intervals.

The treatment above detailed extended over the space of about a year. This patient was finally cured by the application several times of solid nitrate of silver to the urethra behind the stricture. He is now fat and comparatively well, introduces No. 18 himself, and usually passes clear urine. Sometimes, however, it is still slightly tinged with blood for a few days, when it again clears up.

Along with symptoms of vesical irritation, often before any actual inflammation of the bladder has occurred, are found pains various in character and situation. Pain in the urethra, aching of the glans penis, or in the testicle, along the cord running up into the back. Pains across the lumbar region, in the perinæum, around the anus, and in the rectum, over the pubis, etc., and other obscure pains of a neuralgic sort,

in the thighs, legs, or in the sole of the foot[1] (Brodie), all of which pains are cured by the dilatation of the stricture. Urination is often painful (sometimes excessively so), the pain being at the neck of the bladder, in the perinæum, at the point of stricture, or near the glans penis. Erections may be painful, the venereal orgasm attended by pain, the semen not being discharged during the sexual act, but often dribbling away afterward, perhaps stained with blood, or running back into the bladder, to be discharged with the next flow of urine. Impotence sometimes accompanies this condition. The sexual appetite is often impaired, sometimes nearly obliterated, in old severe cases. But, in mild cases, the congestion kept up behind the stricture may be just enough to excite and irritate the patient, causing frequent erections, erotic fancies, nocturnal emissions.

The constant straining in urination keeps the hæmorrhoidal vessels congested. This results not unfrequently in an attack of piles, or of prolapse of the rectum; occasionally, hernia occurs from the same cause. The straining may be so violent that the bowel will protrude at every effort to empty the bladder, making it unsafe for the patient to attempt to urinate except upon a close-stool, for fear of the passage of fæces at the same time with the flow of urine.

The inflammation of the bladder caused by stricture is usually superficial, but it may become parenchymatous, perhaps accompanied by abscess in the walls of the bladder, or in the connective tissue around it. The bladder-walls, as a rule, thicken, while their dilatability diminishes, in cases of stricture (Fig. 54). The detrusor, constantly called upon to force the urine through a narrow orifice, becomes thickened and hypertrophied, sometimes to the extent of one-half or three-quarters of an inch.

Trabeculæ of muscular tissue project upon the mucous surface of the bladder, and between these trabeculæ the mucous membrane may protrude, forming pouches or sacculi. The bladder may contract to such an extent as to have its cavity almost totally obliterated, its muscular walls having undergone fibrous degeneration, which has rendered them nondistensible. In this condition (concentric hypertrophy) we may have a constant flow of urine from the urethra, which the patient cannot control (incontinence), to be carefully distinguished from atony, with overflow.

Instead of incontinence, in this condition, the patient may be obliged to empty his bladder every few minutes, after a few drachms of urine have accumulated, which seem to be bursting the organ. The urinary salts sometimes deposit in vesical sacculi, or a small renal calculus lodges there, forming a nucleus for stone. The more obstruction there is in the urethra, the more pressure is brought to bear upon the sacculi, and the

[1] Or in the great-toe. The pain is sometimes compared to intense heat, sometimes to icy coldness, sometimes it is actual pain over a given small area.

larger they become, so that sometimes they equal, or exceed, the size of the cavity of the bladder. As the sacculus enlarges, its neck remains constant, and, if stone form in it, the stagnant urine (for there is no surrounding muscular tissue to empty it) furnishes constantly fresh supplies of urinary salts to increase the size of the stone, so that finally the latter may fill up the sacculus, constituting what is known as encysted calculus.

Instead of contracting, the bladder may (rarely) dilate. In these cases there has not been so much irritability, and the bladder has not been called into such constant use; or overstretching may have been followed by atony, in which case overflow occurs, apt to be mistaken for incontinence. Inflammation of the mucous membrane is found, in these cases of eccentric hypertrophy also, together with the trabeculæ of hypertrophied muscular tissue and the sacculi.

These conditions of vesical and urethral irritation, or others, such as stone, are sometimes, but very rarely, attended by partial paralysis of some groups of muscles of the lower extremities, or indeed by paraplegia. These paralyses have received the name of reflex urinary paralysis, and seem to depend upon the morbid condition of the urinary organs, and to be relievable, sometimes even curable, by treatment of the urinary difficulty.[1] Not very infrequently mild syphilitic paraplegia is mistaken for urinary reflex paralysis, especially if the urethra or bladder happen to show any trifling lesion.

The urine, in cases of cystitis caused by stricture, is partly decomposed and filled with blood, pus, crystals, etc., as occurs in cystitis from other causes. Phosphatic stone may form. The ureters enlarge in connection with old stricture, sometimes to the size of the thumb. Their walls become unevenly thickened and their calibre enormously increased by the retained urine (Fig. 54). The pelves of the kidneys undergo the same distention, the tubuli and secreting portions being pushed out and compressed by the accumulating urine. After the inflammation at the neck has involved the whole internal surface of the bladder, it may extend up the ureters and enter the pelves of the kidneys, bringing on pyelitis, or attack the secreting portion as a subacute nephritis with more or less suppression of urine, attended by symptoms of uræmia. Finally, and more rarely, may be mentioned abscess of the kidney with perinephritis.

Extravasation.—The thinned and inflamed urethra behind stricture may ulcerate, and, during one of the violent paroxysms of straining, give way, and allow a little urine to escape into the cellular tissue around the canal. The patient is often conscious of something having "broken" in the urethra. The amount of extravasated liquid may be very small, or a sudden gush of urine is, perhaps, let out into the connective tissue.

[1] Brown-Séquard, "Lecture on Reflexed Paraplegia," *Lancet*, 1863; and "Lectures on the Diagnosis and Treatment of the Principal Forms of Paralysis of the Lower Extremities," Philadelphia, 1861.