

continues; finally, the last drops dribble slowly away. This is the mildest pathological degree of atony, and is caused by a paresis of the over-stretched detrusor urinæ. In men of sedentary habits, or those engrossed by absorbing occupations (students, actors), where the calls of nature are habitually disregarded, this slight degree of atony, often reproduced, may finally lead to a permanent lack of the expulsive power. Sometimes actual retention may come on, starting in voluntary retention, the bladder having lost its tone so far as to refuse to contract when an opportunity offers. Passing water habitually in the recumbent position, while lying in bed, is believed to be an occasional cause of atony. Predisposing circumstances are general weakness and laxity of the body. In some cases there seems to be a normal predisposition to this condition, while in others fatty atrophy may induce it.

The form of atony occurring with hypertrophied prostate does not necessarily depend upon mechanical overstretching. It is due to the constant congestion of the hypertrophied muscular coats of the bladder, kept up by the obstacle to the return-flow of venous blood from the bladder-walls, formed by the size of the prostate. With this cause, a certain degree of continual distention of the bladder-walls often goes hand in hand, and, where there has been retention, this circumstance takes its place as the most prominent cause.

Often, atony, from overstretching, owes its origin to retention of urine occurring in the course of acute disease (typhoid, variola), or temporary loss of sensibility (coma, concussion, compression) not recognized and relieved; or, most frequently, to retention complicating stricture in the young, enlarged prostate in the old. Nervous influence has no necessary connection with atony. The injury is mechanical; the over-stretched detrusor urinæ loses its power, and is unable to expel the urine.

*Symptoms.*—The symptoms of this affection have been considered under the heads of its most constant causes, stricture and prostatic hypertrophy. To recapitulate for all cases: in complete atony, the expulsive power of the bladder being lost, the viscus fills up, and we have the condition named by Civiale "stagnation with overflow." The excess of urine, after the bladder has held all that it can, as a passive sac, flows over, upon some muscular effort of the patient (sneezing, violent coughing, laughter), or trickles passively away. In many of these cases of stagnation with overflow, the bladder is patient, and holds, perhaps, two or three pints constantly, without giving its owner any considerable uneasiness. What little excess collects over this amount occasions the normal desire to urinate. This is effected by voluntary contraction of the diaphragm and abdominal muscles, and perhaps an ounce or more of fluid is ejected in a dribbling stream. This brings relief for an hour, when the effort is repeated, with a like result. Such patients are apt to complain that their bladder is so small

that it will only contain a few drops of urine, after the collection of which they are obliged to empty it, which they believe they do. Particularly are these frequent calls pressing, if, as is very apt to be the case, there is some cystitis along with the atony.

All the signs of an over-distended bladder are present with complete atony. The crucial test is the introduction of a catheter. As soon as the eye of the instrument reaches urine, the flow through the tube commences. It does not spurt out as from a normal bladder, but drops down nearly perpendicularly from the end of the instrument. A cough or a long breath will make it flow faster, as will also, very materially, pressure of the hand over the hypogastrium. Operations on the bladder seem sometimes to induce atony (perineal section, lithotrity).

*Treatment.*—The object of treatment of atony is to attempt to restore contractile power to a muscle which has been over-stretched. The first indication is, obviously, to keep the muscle from any further violence, by catheterization performed three or four times daily. In the young we may always hope for a cure; in middle age for amelioration; but in old age with enlarged prostate the injured muscle rarely recovers its tone—nor, indeed, is it very desirable that it should do so.

Besides keeping the bladder from being again distended, we have a very effective means of hastening the return of the contractile power by the employment of cold injections into its cavity. If there be much cystitis with the atony, the cold should be used sparingly, but otherwise the bladder should be filled at each sitting with several successive injections, commencing at the first sitting with water of 90° Fahr., after this has flowed out, following with water at 85° Fahr., and a third time at the same temperature—never more than four ounces of fluid being thrown in at one injection. The water may be retained from one to two minutes, and then be allowed to drain off. This process may be repeated daily, starting at a temperature 5° Fahr. lower at each sitting and proceeding as directed above. Water may be injected as low as 40° Fahr., but it should be allowed to run out again immediately. It acts as a local douche, and is powerful for good in youth and middle life. This treatment may be continued for months, and it will yield good results if any such are possible. The cold douche applied to the hypogastrium, sacrum, and perinæum, is a good adjuvant to the injections. Local applications of electricity may also be employed, an insulated electrode being carried into the bladder, and the current passed directly through its walls to the other electrode in the rectum, or to a moistened electrode over the hypogastrium. No internal medication is of any service, unless possibly a mild alkali to keep the urine from exciting cystitis, or perhaps a little cantharides, strychnine, or ergot, for its specific effect. Tonics and general hygiene may be necessary in special cases.

## PARALYSIS OF THE BLADDER.

As atony is common, so is true paralysis of the bladder uncommon. It occurs only in connection with nerve-lesion, or rarely as a functional nervous affection (reflex urinary paralysis, Brown-Séguard). The causes of paralysis of the bladder are brain-disease attended by hemiplegia (rare), partial paralysis from reflected peripheral nervous irritation acting through the spine (exceedingly unfrequent), any disease or affection of the spinal cord (inflammatory, apoplectic, syphilitic, cancerous, from pressure, Pott's disease, fracture of spine, tumor), especially if such spinal disease be attended by paraplegia, partial or complete. This latter set of causes, which may be summed up in the one word paraplegia, is by far the most active and efficient. Vesical paralysis may come on gradually, as sometimes in Pott's disease and in certain syphilitic paraplegiæ, or (most commonly) suddenly. In the former case the bladder discharges its contents from day to day more feebly, the change taking place perhaps so gradually that the patient does not notice it. Soon some of the urine is retained, only an excess over a certain fixed quantity being voided. This residuum goes through the changes of stagnating urine, and by decomposing lights up cystitis, the more readily on account of the weakened state of the bladder-walls due to impaired innervation. The patient now notices that his urine smells badly, is more or less muddy, perhaps full of thick, ropy mucus, and that he has frequent calls to urinate. Perhaps the paralysis may go no further, but the cystitis will continue to be steadily progressive unless arrested by appropriate treatment. On the other hand, the paralysis may go on to become complete, when retention will at once appear. Very rarely there is paralysis of all the muscles and true incontinence results; but this is so exceptional that it may be said not to occur. Most commonly, as the paraplegia comes on suddenly, so also does the vesical paralysis, and a bladder, at a given moment perfectly healthy, becomes at once incapable of contraction. Retention ensues, the urine over-distends the bladder and then overflows, dribbling away. The bladder becomes inflamed by the decomposing retained urine, pus, stringy mucus, earthy phosphates, vibriones, triple-phosphate crystals abound. The weakened bladder-walls may ulcerate extensively, or become incrustated with earthy salts, or stone may form. It is in some such deplorable condition as this that the bladder usually first receives surgical notice and attention, whereas the whole list of symptoms might have been avoided (except the loss of contractile power) by the application of the proper means at the proper time.

*Treatment.*—When a patient, from any cause, becomes wholly or partly paraplegic, his bladder should not be allowed to become distended. The catheter should be passed soon after the accident, and reintroduced three or four times daily, always with great care, on account of the

insensibility of the parts, and the danger of lighting up cystitis mechanically. At the same time the bladder should be thoroughly washed out with warm water, once or twice after each introduction of the catheter. Colder water may be used later, but this remedy, so useful in atony, has little power over true paralysis of the bladder; on the contrary, it may do harm. Warm water is used simply for purposes of cleanliness, to take away the ferment, mucus, and to prevent cystitis. This can be done, probably, in every case that is properly managed. The following case illustrates the point:

CASE XXVI.—A gentleman of forty-five had an apoplectic effusion into the spinal cord, which was followed by immediate paraplegia and total paralysis of the bladder. The catheter was passed within six hours after the attack, and subsequently three times daily. Tar-water was used as an injection into the bladder. The viscus was kept clean, and was never allowed to become over-distended. Two years afterward his condition was as follows: There was total paralysis of the gastrocnemii and solei, with wasting of the calf, and some wasting and lack of power in the other muscles of the leg and thigh. The bladder was paralyzed, so that no drop of urine could be passed without the catheter, and the stream flowed perpendicularly from the end of the instrument. The rectal sphincter was paralyzed, so that the bowel protruded, unless retained by a pad. Yet there was no cystitis. The urine had a specific gravity of 1020, was acid and clear when passed, and continued acid after standing thirty-six hours. There was no excess of mucus, and no pus except a few little clusters of pus-corpuscles visible to the eye, and evidently coming from the urethra, caused by the constant use of the catheter. The patient had no frequency of desire to pass water.

All this was *two years after the occurrence of the paraplegia*, a period evidently long enough to establish cystitis, if it were a necessary consequence of the paralysis. Here the prompt passage of the catheter, and its subsequent use, which prevented stagnation, together with the injections to keep the bladder clean—for the tar-water was no better than simple water—averted catarrh of the bladder.

Where the patient is not seen until stagnation and overflow have occurred, it is more difficult to keep down the inflammatory outbreak, but the sooner it is attempted the more chance is there of success. After catarrh of the bladder has become thoroughly established, the treatment becomes mainly palliative, but even here much can be done by the systematic, regular use of the catheter, with thorough washing of the bladder, first with warm water, and then with borax, or other mildly stimulating injection, as directed in cases of catarrh, with atony and enlarged prostate (p. 198).

Chronic cystitis being, as has been shown, a secondary disease, the main reliance of treatment, in any case, consists, after the removal of the cause, in the surgical measures already enumerated, injections into the bladder, medicated or otherwise, position, and external counter-irritation. The terebinthinate and stimulating diuretic drugs habitually employed, though of service in certain selected cases, are of far inferior importance. The value of these drugs is secondary, and is greatly overrated by the profession; they do more good as diluents than by any specific virtue, and, being generally combined with anodynes, the reputation which they

enjoy is really more often due to virtues of these latter than to any special power of their own in controlling vesical symptoms.

#### HETEROLOGOUS DEPOSITS AND TUMORS IN THE BLADDER-WALLS.

The bladder is rarely the seat of any foreign growth, yet certain deposits and tumors are found here. These are (*a*) cheesy tubercle, (*b*) fibrous growths, (*c*) cysts, (*d*) cancer, (*e*) villous tumor.

These different new formations cause symptoms more or less severe according to their situation and size. Thus, by pressure on a ureter, they may lead to distention of that canal and of the pelvis of the kidney, with (possibly) final rupture of one or the other, or atrophy of the secreting portion of the kidney. Again, the growth may be near the neck of the bladder, presenting an obstacle to the escape of urine, which may even lead to complete retention; while, on the other hand, if it springs from the fundus away from the sensitive portions around the neck, it not only does not oppose any obstruction to the free outflow of urine, but, in exceptional cases, may give rise to little if any cystitis. Some of these tumors, again, become engorged with blood from motion or other cause, and then all the symptoms are aggravated. When a free flow of blood takes place, the symptoms remit and the patient feels better. The above remarks apply to the whole category of foreign growths taken together, and to no particular class.

(*a*.) CHEESY TUBERCLE.—Tubercle of the bladder does not occur as an isolated affection. It is not very often encountered in connection with pulmonary tuberculosis, but comes on more frequently with tubercular ulcerations of the intestines, and is especially common with similar disease of the kidney or prostate, or even with advanced tubercularization of the testicle, cord, and epididymis. The glands and follicles, usually, near the neck of the bladder and orifices of the ureters first suffer. Groups of little whitish elevations, surrounded by a red areola, may be seen at first, and these, going on to increase, coalesce and break down into cheesy degeneration and ulceration, sometimes leading to perforation of the bladder.

The diagnosis is mainly made by exclusion. The bladder-symptoms are simply those of chronic cystitis, more or less severe according to the situation of the deposit. There is rarely much blood in the urine. The exploring sound may sometimes detect the ragged ulcerations and appreciate the thickening of the bladder-walls. Beyond this, exploration is usually negative; no tumor is felt either by the sound in the bladder, or by rectal or hypogastric palpation; while the *débris* of tissue found in the urine has no distinctive characters. The diagnosis usually rests upon the general condition of the patient, and the state of the whole genito-urinary apparatus. Advanced phthisical disease elsewhere, of the lungs, intestines, etc., but particularly of the epididymis, with a

ridgy, knobbed feel of the seminal vesicle and vas deferens of the same side, especially if there is evidence of prostatic trouble, and above all, any suspicion of tubercular pyelitis—any of these concurring symptoms makes the diagnosis probable, while all of them would make it certain. The disease occurs most frequently in youth and early adult life. They are always serious, generally desperate.

*Treatment.*—The treatment is the same as for phthisis elsewhere—proper warmth, fatty food, fresh air, out-door life, tonics, etc. Locally, anodyne suppositories, if pain be great, rest, alkaline diluents; finally, syringing the bladder with warm water occasionally, unless the introduction of the instrument produces too great pain. These patients rarely recover.

(*b*.) FIBROUS TUMORS.—These tumors are not common, but occasionally one or more of them are found in the bladder, where they give rise to trouble mechanically, being perfectly benign in character, composed of connective-tissue elements, growing in and from the submucous connective tissue. They appear first as slight elevations. These enlarge and grow into the cavity of the bladder, sometimes becoming pediculated. They are to be distinguished from the irregular polypoid overgrowths from the posterior urethral orifice of the prostate, and from supernumerary prostatic tumors.

*Symptoms.*—Careful sounding with a Thompson's searcher, or, perhaps better, a lithotrite, may detect the position, size, and perhaps the number of the tumors. The recent method of exploration introduced by Simon, of Heidelberg, namely, by a hand introduced into the rectum while the patient is anæsthetized, might be tried in obscure cases. The rarity of blood in the urine distinguishes them from villous growths. The amount of cystitis is usually not so great as in tubercle, while the cachexia and occasional profuse bleeding of cancer are wanting. Children and young adults are most liable to be affected.

*Treatment* is palliative—alkaline laxatives, anodyne suppositories if necessary, warm washing of the bladder, use of catheter, etc.

(*c*.) CYSTS are rare in or around the bladder, but occasionally they are found. They sometimes contain bone, teeth, muscle, and hair, which occasionally find their way by ulceration into the bladder, and constitute nuclei for stone, or give rise to pilimiction.<sup>1</sup> Hydatid as well as simple cysts have been encountered. A striking case of cyst of the bladder is reported by Liston.<sup>2</sup> The diagnosis was made with the aid of a catheter, which was being passed for retention. The instrument struck against a soft, movable mass at the neck of the bladder. Liston decided to perform epicystotomy at once, and removed a large cyst very like the bladder in volume, form, and appearance.

(*d*.) CANCER is rare in the bladder, but still it is more common than benign forms of tumor, or other foreign growths not inflammatory. It

<sup>1</sup> "Mémoire de la Soc. de Biologie," 1850, Rayer. <sup>2</sup> *Medical Times*, August, 1862.

may originate in the bladder, but more often is an extension of disease from the prostate or bowel. When occupying the bladder it may grow from any portion of the walls, but usually springs from near the neck or orifices of the ureters. Different varieties of cancerous growth have been encountered. The encephaloid (soft) cancer is by far the most common. Scirrhus and the epithelial are less frequently observed; colloid cancer has been seen. The cancerous nodules develop under the mucous membrane in the walls of the bladder, and often grow to the formation of a considerable tumor. Encephaloid, especially, may grow out in a fungous manner, until it fills the whole cavity of the bladder. Cancerous growths go through the same phases here as elsewhere, finally ulcerating and destroying life by loss of blood or cachexia, or wearing out the patient by extreme pain.

*The symptoms* vary but little from those of other tumors. There may be the same mechanical obstruction to the escape of urine, due to the position of the growth, and calling for the use of the catheter, the same cystitis, more or less intense, according to the position and size of the tumor and the extent of ulceration; but in several particulars the symptoms of cancer in the bladder are special, and the diagnosis more easy than for other tumors. The pain is more severe, is referred to the back, loins, and thighs, as well as to the pubic and perineal region; enlarged glands may sometimes be felt along the brim of the pelvis. The bleeding is usually intermittent in character; at first there may be long intervals of months between the paroxysms. The blood flows suddenly and profusely, in clots and fluid, attended by great pain. After each bleeding the severity of the symptoms lessens. Between the attacks there is more or less oozing, sometimes enough to keep the urine constantly red; sometimes, during the earlier months of the disease, only to be detected by the microscope. The introduction of a catheter is very apt to occasion hæmorrhage, and should be avoided as much as possible. Sometimes shreds of tissue, projecting from the borders of an ulcerated, cancerous nodule, will be caught in the eye of the catheter, and be pulled away. The microscopic examination of such shreds may sometimes throw light upon the nature of the tumor. In the middle and later stages of the disease the cancerous cachexia may be marked, and the bleeding more constant and profuse, while the intervals between the paroxysms will be shorter. Finally, in scirrhus, the hardness can be felt by the finger in the rectum, and in the common form of cancerous disease, medullary, the size which the mass attains renders it nearly always easy of detection long before it has advanced far enough to be fatal. This growth has been mistaken for enlarged prostate. Its general size, shape, and position, may be studied out with the searcher, while the finger in the rectum will sometimes recognize a peculiar, soft, semi-elastic tumor behind the prostate, and be able to appreciate pressure made upon the tumor above the pubis. Cancer, here as elsewhere,

is a fatal disorder. The treatment is purely symptomatic and palliative, keeping up strength by all known tonic and hygienic means, and using the same sedative and local treatment as for other tumors of the bladder, employing special means as they are required by special cases. Opium ranks first in usefulness.

(e.) *VILLOUS GROWTH*.—There is a peculiar growth encountered in the adult bladder, known as villous tumor. It occurs less frequently than cancer, but perhaps more frequently than fibrous or cystic tumors. It has been considered malignant, but can lay claim to the title on no score except that it often kills. It is a soft, pulpy body, growing to the size of a nut, constituted by innumerable villi, which branch off in every direction, are attached to the submucous connective tissue of the bladder, are identical in structure with the villi of the healthy chorion, and are exceedingly vascular. Several tumors may coexist in a single bladder, or a portion of bladder-surface may be found velvety, from being covered by small villous processes similar to those on the tumor.<sup>1</sup> The most usual site for these tumors is the base of the trigone, between the orifices of the ureters. There is nothing cancerous about their structure. Their cause is unknown. They never lead to secondary cancerous deposits elsewhere. They do not spontaneously ulcerate. The lymphatic glands are not implicated. There is no characteristic cachexia. When they kill, death seems due purely to loss of blood and exhaustion from pain.

*The symptoms* of villous growth are like those of other vesical tumors, except that they are less often obstructive, and that the urine has blood in it almost constantly. No tumor can be felt, as the mass is too soft to be recognized either by the finger in the rectum or the searcher in the bladder. Sounding almost invariably aggravates the symptoms, and gives rise to a fuller supply of fresh blood. Shreds of the tissue sometimes come away with the urine, and may show characteristic appearances under the microscope. The structure of the growth is simply an enormously wide, thin-walled vessel, curved on itself to form a loop, and covered by three or four layers of cylindrical epithelium, seemingly placed directly upon it.<sup>2</sup> The suffering is often intense, and vesical tenesmus very marked.

*The treatment* is mainly palliative—opium suppositories, internal hæmostatics (?) and mild astringent solutions (acetate of lead, nitrate of silver, tannin) injected carefully and tentatively into the bladder. These, with hygiene and rest, are all the relief that art at present affords.

In desperate cases an attempt might be made to open the bladder and remove the tumor, cauterizing its base. The difficulties attending such an operation do not need description to be realized. In favorable cases pediculated tumors of this sort have been successfully removed, and have not returned.<sup>3</sup>

<sup>1</sup> "Lectures on Pathological Anatomy at Guy's Hospital," 1857 and 1858, Samuel Wilkes, 1859, London. <sup>2</sup> Rindfleisch, "Pathological Histology." <sup>3</sup> Ibid.