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ATONY OF THE BLADDER.

A CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

By J. WILLIAM WHITE, M.D.,

*Professor of Clinical Surgery, University of Pennsylvania; Surgeon to the  
University, Philadelphia, and German Hospitals.*

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*presented by the author -*





screw at the ankle joint to bring down the heel and prevent relapse. This has already been made in the orthopædic machine shop.

OPERATION.—The foot having been previously prepared, the patient etherized, and placed prone, the plantar fascia was rendered tense by abducting the foot, a straight sharp-pointed tenotome was inserted flatwise between the skin and fascia, turned with its edge downward, and the fascia divided from without inwards. The tendo Achillis was next rendered tense by depressing the foot, a straight sharp-pointed tenotome was inserted flatwise on the inner side, and carried across beneath and in close contact with the tendon, the edge was turned upward, and with a slight sawing motion the tendon was divided. Both punctures were sealed with lint soaked in compound tincture of benzoin and held in place with adhesive plaster, the deformity was slightly over-corrected, and the limb was covered with a flannel bandage and fixed in plaster.

[When the plaster was removed about ten days after the operation, the wound was found to be healed, whereupon the shoe was applied, and the patient discharged, able to walk without difficulty.]




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GENTLEMEN: The patient whom I bring before you to-day has recently been admitted to the hospital on account of a trouble connected with his genito-urinary apparatus. I state the case thus vaguely because I wish to examine him in your presence and endeavor to illustrate to you the importance of following a definite method in attempting to reach a diagnosis. It is often possible, by a few well directed questions, to exclude a large variety of possible conditions and to arrive at an approximate diagnosis in these cases without even touching the patient. Your opinion may then require to be confirmed by further exploration instrumentally or otherwise, but you will have saved time in all cases and in many will have avoided paining or alarming a nervous invalid.

Let us begin, for example, in this instance, by asking this patient, who is fifty years of age and a laboring man, whether or not he suffers from pain. He tells us that he has slight pain, felt chiefly in the hypogastric region and relieved by the act of urination. Toward what conditions does this symptom point? The pain of genito-urinary disease may be considered in relation to the region in which it is felt, and the time at which it is felt. In regard to the first subdivision it may be remarked that the region to which the pain is referred should not be considered as necessarily the seat of trouble. A stone in the bladder causes pain which is felt at the under surface of the penis, a short distance back of the meatus; disease of the kidney constantly gives rise to pain

which is felt chiefly in the groin, down the thigh, or in the testicle; while disease of the testicle in its turn produces pain radiating along the inguinal line. In the majority of instances, as in those mentioned, referred pain is due to the irritation of a nerve trunk, the abnormal sensation being transmitted to the point of termination of the nerve; pain, however, may of course be felt at the seat of trouble itself, as, for example, in urethritis where the pain is felt in the inflamed urethra, in cases of retention of urine where it is referred directly to the bladder and hypogastric region, or in cases of prostatitis where it is felt in the rectum and perineum. In some cases of the last-mentioned trouble the pain is duplex in character, being both localized and referred—a patient with a threatened prostatic abscess having rectal pain and urethral pain at the same time, the latter closely resembling that produced by vesical calculus.

The second subdivision of our question in regard to pain refers to the time at which it is felt. Pain during micturition may be due to cystitis, prostatitis, or urethritis, or to the passage of gravel, or to a small calculus. Pain before micturition, which is relieved by that act, may be due to cystitis, or to retention of urine. Pain which is increased at the end of micturition may be caused by vesical calculus, or by acute prostatitis. If it is markedly increased during defecation it points to the latter trouble; if relieved by rest and much increased by movement it indicates the former condition.

Our next question to the patient should refer to the act of micturition itself and we learn immediately that he is urinating too frequently. Increased frequency of micturition is a diagnostic sign which is only of value when considered carefully in its relation to other symptoms. Normal micturition depends upon the healthfulness of a certain nerve tract which, beginning in the peripheral extremities of the nerves distributed to the genito-urinary apparatus, extends to a certain portion of the lumbar enlargement of the spinal medulla; and thence again along other nerves to the muscles of the bladder and urethra. If the sensory nerves are unduly irritated frequent micturition results. This is seen in phimosis, contracted meatus, urethral stricture, urethritis, cystitis, prostatitis, vesical or renal calculus. If, on the other hand, the stimulus to these sensory nerves remains normal but the spinal centre becomes irritable, the same effect is produced, as in cases of sexual excess, or spinal concussion. The nerve supply may remain normal and yet frequent micturition be produced by either an excessive secretion of urine as in case of diabetes, or by such contraction of the bladder as renders it disproportionally small so that it is overdistended by even a normal amount of urine. Or, again, micturition may be too frequent from some obstructive cause, such as hypertrophy of the prostate, or when from some weakness of its muscular walls, the bladder fails entirely to empty itself, always retaining several ounces of urine. A condition which seems to combine the hypersecretion of urine together with intolerance of the bladder is that known as "nervousness," and in its most aggravated form as hysteria.

It is evident, therefore, that we know but little which is of value so long as we simply know that the patient urinates too often. Further light, however, may be thrown upon the subject by a question as to whether or not the frequency is increased by movement or by rest. If the former, a stone in the bladder, or a

pedunculated growth of the bladder may account for it. If the latter, it may result from retention of urine due to atony, or to an enlarged prostate. The patient with these last-mentioned troubles will find that he urinates more frequently at night than in the day-time. His nervous centres are more receptive to stimuli from the bladder when he has only himself to think of and his attention is not distracted by the noise, bustle, and confusion of the day.

There are, however, still other points in relation to this act which will help us greatly in arriving at a conclusion. In the first place: Is the size of the stream diminished? If so, it suggests the existence of a stricture, a contracted meatus, or an inflammatory swelling somewhere along the urethral tract. If the force of the stream is diminished it suggests obstruction, as from stricture or prostatic disease, or muscular weakness as in atony. If the time required for the act of urination is increased it likewise suggests obstruction or weakness. Our patient tells us in reply to questions that his increased frequency is most marked during the night, that the force of the stream is lessened, the urine falling nearly at his feet and that the time required for each separate act of micturition is greatly increased. We have then a group of symptoms which point strongly in one direction; hypogastric pain lessened by urination; increased frequency of micturition, worse at night; diminished force of the stream of urine and increased time required for each act, the calibre of the stream remaining unaltered. These considerations alone almost justify us in excluding vesical calculus or tumor, urethritis, cystitis and prostatitis, and renal calculus.

They do not, however, exclude hypertrophy of the prostate and atony of the bladder, which are the two conditions to which our attention should next be directed. There is nothing in the history thus far elicited which is incompatible with the existence of either of these troubles, but the age of the patient rather militates against the idea that his frequent micturition is due to true prostatic hypertrophy. This enlargement of the prostate rarely makes its appearance before fifty years of age and usually somewhat later in life. It is a general hyperplasia as a rule, but the fibrous portions of the gland may occur in excess of the other constituents and form small separate tumors imbedded in its substance. In any case, if the enlargement involves the middle lobe and encroaches upon the urethral calibre and the vesical neck, the bladder cannot entirely empty itself, and after each act of micturition there remains behind a small but constantly increasing quantity of urine, which in time becomes a source of irritation in one of two ways: it may increase in quantity to such an extent that the bladder will hold no more than two or three ounces additional, so that as often as that amount of urine is excreted it becomes necessary to void it; or, ammoniacal decomposition of the urine may occur followed by cystitis. This is a common result of the introduction of micro-organisms upon half-cleaned catheters. In one or the other of these ways prostatic hypertrophy may produce frequent micturition and in a small proportion of cases it probably does so by the directly irritating effect upon the neck of the bladder. A rectal examination now enables us in a few seconds to exclude this condition, the prostate being of absolutely normal size and consistence. We are, therefore, led to consider the

possibility of the existence of the condition known as atony of the bladder, which is by no means uncommon, and which may even be said to exist in a minor degree in almost all persons past middle age. Every male adult who will carefully observe his own experience will in all probability find that he is unable to eject as forcible a stream of urine from the bladder as when he was a boy, and this slight enfeeblement increases very distinctly when middle age is past. It is not, however, of this form of atony, which may be said to be physiological, that I desire to speak.

There is another variety which is a true muscular paresis, an actual loss of tone, as the name implies, in the muscular walls of the bladder, a positive weakness associated with noticeable pathological changes and dependent upon well recognized causes. There is a distinct thinning and weakening of the muscular coat of the bladder, sometimes associated with fatty degeneration of the muscular fibres, sometimes with a fibroid change resulting in contracture precisely similar to that which occurs in disused muscles elsewhere. In the one case we have the bladder, a mere flaccid pouch capable of distension to a large extent but quite incapable of completely emptying itself. In the other it will hold only a few ounces of urine but cannot completely evacuate that quantity.

Between these two extremes and a condition of health there are all grades and degrees of atony. A common cause of these retrograde changes in the bladder apart from senility is over-distension, which may be chronic and dependent upon some obstructive condition such as enlarged prostate, vesical tumor situated near the neck of the bladder, tight urethral stricture, etc. ; and again may have resulted from true paralysis of the bladder which is very apt in neglected cases to be followed by secondary atony ; or may have been due to persistent neglect of the calls of nature on the part of the patient, whose occupation or whose pleasures were so preoccupying as to lead him habitually to postpone the emptying of the bladder until the need of doing so was imperative. Or, the cause may have been acute over-distension happening on some one single occasion when for a long period it was impossible for the patient to find an opportunity to urinate. In these instances the over-stretching of the muscular fibres is probably the active factor.

In this particular case we have now arrived at an approximate diagnosis without having disturbed the patient other than was done at the time of making the rectal examination, nor have we spent much time in getting an elaborate history. A few questions, now, elicit the fact that this patient has on more than one occasion been exposed to great over-distension of the bladder, and that he dates his troubles from the first of these occurrences. Having obtained this confirmatory evidence we may proceed rapidly to eliminate all possible error by making the following additional examination: A bougie-a-boule No. 26, French scale, is passed easily into his bladder and meets with no resistance on withdrawal except the normal physiological hitch at the edge of the triangular ligament. This excludes stricture and also any possible enlargement of the middle lobe of the prostate not to be felt through the rectum. A vesical sound introduced and carefully rotated in the bladder shows that no form of calculus is present. I will now ask the patient to urinate in your presence, and you will

observe that he does so with some apparent difficulty, the abdominal muscles contracting strongly to aid the feeble expulsive effort of the bladder. The stream, which is of fair size, flows slowly and if not received in the basin would fall at the patient's feet. The urine when tested is neutral in reaction, and is normal in general appearance so that both acid urine and cystitis, which are possible causes of frequent micturition, may be excluded. I now ask the patient to lie down again and introducing a soft catheter draw off as you see about four ounces of urine, although he was quite unable to void another drop and thought that his bladder was empty. It is this residual urine, as it is called, which, both in cases of prostatic disease and in vesical atony, constitutes at the same time a serious difficulty and a guide to the proper treatment. If allowed to accumulate it will sooner or later result in over-distension of the bladder, or it may decompose and set up a troublesome cystitis. It should always be evacuated by regular catheterization, which should be performed two, three, or four times daily according to the quantity of residual urine. This is, of course, a form of retention of urine, but that expression is usually associated with the idea of complete retention, the result of obstructive disease of the urinary tract or of an absolute paralysis of the bladder wall. When this is acute it is readily recognized by the history of non-evacuation of urine and by the presence of the characteristic hypogastric tumor which soon becomes abdominal if no relief is afforded. But there is a partial retention of urine of which this case offers an example, which, though not so immediately dangerous is, by reason of its greater frequency, a far more important surgical condition. In its lower grades it is often not recognized and the symptoms of frequent micturition, loss of force in the stream, dribbling of urine, etc., are referred to cystitis and treated accordingly. Of course there may be a combination of various conditions associated with atony and with partial retention; in other words the original lesion may have been a stricture of the urethra, or an acute prostatitis, or a prostatic growth, or an impacted urethral calculus; or it may occur after certain operations, particularly those upon the lower end of the rectum, as the ligation of hemorrhoids, when there is often a reflex inhibition of the micturition centre of the spinal cord followed by retention of urine. But in all these cases it is the over-distension and atony which finally constitute the most efficient cause of partial retention of urine, and this I believe to be true, even in cases of prostatic enlargement in which there is a permanent obstacle to the free passage of urine. As all other conditions have been excluded in the present case, and as you now have a clear understanding of its etiology and of the underlying pathological condition, it only remains for me to speak to you of the proper treatment. I regret that my teaching in this respect cannot be more hopeful, but I fear that you will find these cases of atony, however caused, among the most difficult forms of bladder disease that you will be called upon to treat.

I may group the methods of treatment which are worthy of trial under four heads—premising that if there is marked cystitis a preliminary course of treatment may be necessary before the other methods can be fairly put into application:—

1. Catheterization. The patient should be instructed in the use of a catheter.

ter, and should also be told how to keep that instrument aseptic, and how for greater precaution to disinfect it before each insertion. He should use it in cases where four ounces of urine are retained, twice daily, night and morning; if the residual urine reaches six ounces he should use the catheter once every eight hours; and if it amounts to eight ounces catheterization should be employed every six hours.

2. Irrigation of the bladder with cold boracic solutions beginning at a temperature of 90 to 100 degrees, and gradually reduced. Or permanganate of potassium in the strength of two or three grains to the ounce will often be found of great use.

3. Electricity is often of considerable benefit, and may be applied in the manner long ago suggested by Sir Henry Thompson. An insulated electrode is carried into the bladder, and the other moistened electrode placed over the hypogastrium, a weak current being passed directly through the walls of the bladder. The strength is gradually increased until slight sensations of discomfort are experienced. The application may be varied occasionally by putting the other electrode in the rectum. In mild cases which have come under my care immediately after the occurrence of over-distension, this is an extremely useful adjuvant, but in later and more serious cases I have not found it of much benefit.

4. Strychnia is the only drug which, in my experience, has seemed to produce beneficial results in these cases; and even upon it but little dependence can be placed. It may be given in combination with ergot, cantharides, or tincture of the chloride of iron.

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## MEMORANDA.

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### A CASE OF ABSCESS OF THE GALL BLADDER.

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ON the 26th of June, 1888, I was called to see Mrs. H., who for two weeks had been suffering from repeated chills. The history which I obtained from the family was as follows:—

Mother and two sisters had died of cancer. Patient herself was 76 years of age, the mother of several healthy children. With the exception of rheumatic pains, confined to the left hip-joint and leg, from which she had been a constant sufferer for the past twenty years, she had always enjoyed good health. During the summer of 1888 she had an attack of jaundice which lasted two or three days, but which was not accompanied by any hepatic colic nor the passage of gall-stones. For the past two weeks she had complained at various times of severe sharp shooting pains which extended from epigastric across hypochondriac regions to right shoulder blade; these were frequently followed by a chill, with fever and sweats. I found the patient on my arrival suffering from a marked rigor, with pale face, blue lips, and cold extremities, a rapid weak pulse, hurried breathing and skin covered





