

rially in the rapid subsidence of the effusion into the joint and of the swelling about the knee-cap. About the fifth or sixth day I applied over the patella a soft metal ring pessary covered with india-rubber tubing moulded so that it encircled the patella. I then passed a loop through the ring upon either side and carried it back around the plaster-of-Paris splint, putting some batting above and below the knee-cap. Sufficient traction was made on the ring to secure a retention of the fragments of the patella in fairly good approximation. The two fragments of the patella should be approximated by the fingers before applying the ring. The ring should be watched, to avoid undue pressure. I usually keep the patient in bed four or five weeks. The patient is then allowed to move about on crutches. After eight or twelve weeks the splint may be removed and moderate motion of the knee-joint be permitted. The patient should not use the leg in walking for at least three months, and not freely for four or five months.

The results following such treatment have been fairly good, free motion being obtained, and a close fibrous union of the fragments being the rule. I resorted to this treatment in preference to the exposure of the fracture and the wiring of the fragments.

## Genito-Urinary and Venereal Diseases.

### HYPERTROPHY OF THE PROSTATE.

LECTURE II.

BY FRANCIS SEDGWICK WATSON, M.D.,

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GENTLEMEN,—The urine in cases of patients with prostatic hypertrophy furnishes important indications of their condition. The most significant sign of all is the specific gravity. If a patient with prostatic hypertrophy has a urine with a specific gravity of 1010 or less, no matter whether the urine be free from any other evidences of renal trouble or not, this fact alone indicates danger for the patient, and is an evidence of what has been termed, in the absence of further proof of organic renal disease, *renal insufficiency*, by which term is meant that, although the kidneys are not the seat of sufficient pathological change ordinarily to produce death, nevertheless death is likely to ensue under very slight provocation, from suppression of urine or urinary fever and their consequences. This fact is, to my mind, the most important one in connection with the urinary examination. Other than this the urine, of course, presents, in a case in which cystitis exists, the ordinary characteristics of that disease,—viz., alkaline reaction, pus, mucus, blood-corpuscles, alkaline deposits, such as precipitates of the triple phosphates, etc. It is in these cases of cystitis in connection with hypertrophied prostates that we often see the most severe forms of the disease, the reason for which is the inability of such bladders to empty themselves, as has been already described, and that, as a consequence, pus and mucus and decomposing urine remain within the bladder as a source of ever-increasing trouble; so that not infrequently the latter part of the urine is made up almost wholly of such tough, stringy mucus and pus that it will only flow through a large-eyed catheter, and then often with difficulty. Beyond the facts just pointed out, there is nothing of special importance in connection with the urine of these patients. It is surprising how long a chronic urinary obstruction, going even to the point of urinary retention and an overflow

bladder, may persist in cases of prostatic hypertrophy without cystitis occurring, and with the urine showing no signs whatever of trouble, except a low specific gravity. In connection with the condition of the kidneys which I have designated by the name of renal insufficiency, and also in a more marked degree in those cases of cystitis with or without hydro- or pyo-nephrosis superadded, there are certain constitutional disturbances which have also marked significance, and which are due to a chronic form of uræmia. The more noticeable symptoms of this condition are a coated tongue,—the tongue being cracked, dry, and brown, the mouth parched, or sometimes a very red tongue; flatulence; an occasional feeling of nausea; more or less muscular weakness, especially of the legs; thirst; and an irregular action of the bowels. This group of symptoms, in connection with the local conditions just referred to, is very significant of danger to the patient, for it indicates, as a rule, that the renal insufficiency, even if no more grave disease of the kidneys is present, has advanced to a dangerous point.

#### TREATMENT.

In concluding this lecture I shall briefly summarize the more important points on the *palliative* treatment of this disease. Bear in mind the fact that it is the presence and the increasing amount of residual urine in the bladder, and their consequences, that are primarily the most important factors in this malady, and you can see at once that the treatment which will rid the bladder of its unnatural load and allow it to empty itself again entirely will constitute the most important feature; and *it is the use of the catheter* which is, indeed, the most important element in the treatment. The *amount of residual urine* which should determine the use of the catheter varies in the practice of different surgeons, and is an arbitrary one. My own rule is this. The residual urine may be as much as six ounces without the catheter being necessary, provided the presence of that quantity in the bladder has not caused the patient to get up more than once at night to urinate, and has not caused urination during the daytime more frequently than once in two or three hours, and if the urine is clear; in other words, if no cystitis be present. In any case in which the residual urine exceeds six ounces I have found it better to use the catheter once in twenty-four hours at least. And here let me say that catheter life is not to be entered upon lightly. This point cannot be impressed upon you too strongly, for, in spite of the innumerable warnings scattered through all the writings and teachings on prostatic hypertrophy against the practice of carelessly drawing off suddenly a large quantity of residual

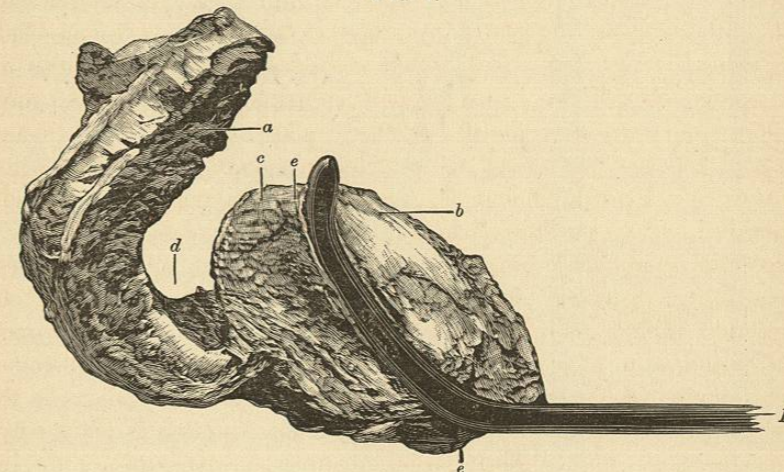
urine with a catheter which is not thoroughly clean, such remains the bad and frequent practice with many physicians. While it is perfectly true that many cases will have no trouble following such a procedure, it is equally true that every year where such practice occurs a certain number of deaths may be directly laid to its door; and special precautions should be taken in beginning the use of the catheter with patients whose urine has a low specific gravity, and when the residual urine is already large,—*i.e.*, from eight ounces upward. It is in that special class of cases that the sudden withdrawal of the urine is sometimes followed by urinary suppression and death, or by the constitutional disturbances characterized by chills, fever, dry tongue, mild delirium, or presenting itself in another form, with a weak pulse, fainting, tendency to collapse, and so on. It is never a mistake to be on the safe side and to do the best we can to avert these misfortunes, and if you will observe the following rules you will have done your best to avoid them. When it is intended to begin the use of the catheter, confine the patient to the house for at any rate the first five or six days of its use. Pass whatever instrument is used with great gentleness. Never use force in trying to make a catheter enter the bladder. If the residual urine is more than eight ounces, do not withdraw it all at once; stop when eight ounces have been evacuated, and if that quantity should represent *all* the residual urine, even then inject two ounces of a four-per-cent. warm boracic acid solution into the bladder, instead of leaving it quite empty. Where the residual urine does not exceed six or eight ounces and no cystitis is present, it is unusual to be obliged to use the catheter more than once in twenty-four hours. If, however, with that quantity (whether in the presence of a cystitis or not) the frequency of urination previous to the passage of the catheter has been marked,—*i.e.*, every one or two hours in the daytime and three or four times during the night,—and it is not relieved by the single use of the catheter each day, the irritability of the bladder may be relieved by the passage of the catheter as often as three or four times in the twenty-four hours. If, however, at the beginning of catheter life the passage of the instrument creates a marked irritability of the bladder, this irritability having been previously absent, then suspend the regular daily use of the catheter, and allow one or two days, or such a time as may be required for the bladder to become less irritable in the absence of the instrument, to elapse previous to making a second attempt. There is, however, one condition in which the rule just laid down cannot be observed, and that is when the surgeon is dealing with a case in which there is retention present or threatened, and especially if there be a

large residual urine: if the regular use of the catheter has been begun in such a case and cystitis with its local and general symptoms occurs, it is, I think, safer to tie a soft rubber catheter into the bladder instead of interrupting its periodic use, and to let it remain, changing it for a clean one every three days, until the urine shows a decreasing amount of pus or becomes again clear, and fever and such constitutional symptoms as may have been present have greatly improved or ceased, the catheter may then be removed, and its regular daily use resumed. So long as cystitis is present it should be treated by the use of bladder washes in the manner to be described at the end of this lecture. It sometimes happens that the first one or two attempts with the catheter are followed by great irritability of the bladder and by constitutional reaction and disturbance, and yet a subsequent attempt may be crowned with entire success. If an over-distended bladder is present, it must be approached with the utmost caution by the catheter. The patient should be confined to bed, put upon a light diet, and kept warm. The catheter should be gently introduced and the over-distended bladder relieved very slowly and of but comparatively small portions of its contents at a time. Such over-distended bladders may hold anywhere from one quart to two or three quarts of urine, and in any case, at the first passage of the catheter, not more than eight or ten ounces of the urine should be removed, and in the manner already described,—*i.e.*, a portion of the fluid removed should be replaced by a couple of ounces or so of a four-per cent. boracic acid solution. These greatly over-distended bladders occurring in the course of urinary obstruction rapidly refill, and polyuria almost invariably follows upon the withdrawal of a large amount of urine. Therefore it becomes necessary within a very few hours to relieve the bladder again. In the first twenty-four hours the catheter may be used as often as four or five times, withdrawing a slightly larger quantity at each sitting; for instance, beginning with eight ounces and increasing the amount by two ounces at each of the four uses of the catheter. In this way in the course of a few days, as a rule, the bladder may be emptied; but I have seen one or two instances where it required between two and three weeks of such daily use of the catheter before the bladder was wholly emptied.

Another method of emptying such over-distended bladders, and one which promises, I think, greater immunity from the occurrence of urinary fever in these cases, is that of frequent aspiration by means of a fine needle introduced above the symphysis pubis. The urine may be withdrawn by repeated aspirations (to the number of four or five a

day) in the same quantities as if the catheter was used, and the bladder thus gradually emptied. After three or four days of the aspirations, if the contents of the bladder have become largely reduced and its over-distention relieved, the catheter may *then* be substituted, and I think with less risk of setting up urinary fever than had it been used at the outset. If abscesses should form about the points of puncture, the aspirations should not be continued. Another rule of importance is that of keeping the catheter as clean as possible. The soft red rubber catheters can be easily kept in an aseptic condition thus. Let a stream of warm water run through them immediately before and after use, and after use syringe through them a solution of carbolic acid of the strength of one part to twenty. The catheter should then be once more washed with warm water, and placed in a tube or bottle (which can be corked) containing a saturated solution of boracic acid,

FIG. 1.



Represents a perpendicular section through the bladder, median enlargement of the prostate, and prostatic urethra. In the prostatic urethra lies a Mercier bicoudé catheter (*F*), the instrument having its natural form. *a*, greatly thickened bladder wall; *b*, left lateral lobe of prostate; *c*, middle prostatic lobe; *d*, bas fond of interior of bladder behind the hypertrophied middle lobe; *e*, represents the course of the prostatic urethra. (Photographed from fresh specimen by the author.)

which neither rots the catheter nor causes it to irritate the urethra when again passed. The boracic solution should be frequently changed. The webbing catheters which are shellacked are spoiled by being kept in fluids, and therefore the best treatment is to wash them thoroughly with warm water before and after use, and then to syringe a quantity of corrosive sublimate solution through them, dry them, and keep them

in a clean place until next required. It is a frequent custom for patients to carry their catheters in their pockets, where they necessarily become dirty, and then are liable to carry septic materials into the bladder.

Next in importance to the *method of using* the catheter is the form of the instrument to be used. The statement which follows will

FIG. 2.



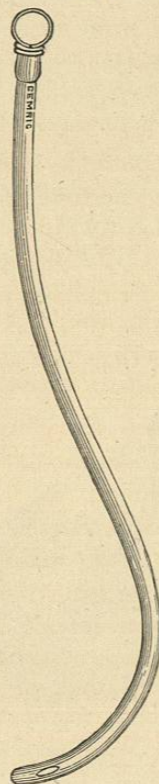
Mercier's coudé catheter.

FIG. 3.



French bougie catheter.

FIG. 4.



Over-curved flexible catheter.

sound, I am aware, arbitrary. I give it to you only as a matter of my personal preference. I have never been obliged, and do not think I ever shall be obliged, to use a metal catheter to enter the bladder over a prostatic obstruction. I advise you against this instrument, because, except in skilled hands, it is dangerous and likely to make false passages. The form of catheter which will enter the bladder in these cases more readily than any other is, I think, that called the *Mercier bicoudé*, or double-elbow catheter, which is shown in the accompanying illustration (Fig. 1). Fig. 1 illustrates admirably how this double-elbow catheter is adapted for its purpose in some cases.

It will be seen in this

figure that the catheter conforms very exactly to the shape of the posterior portion of the urethra in cases of large obstructing middle lobe hypertrophies of the prostate, which are those which, as a rule, present the greatest difficulties to the passage of the instrument. Next to the bicoudé the coudé catheter (Fig. 2) is most serviceable. Occasionally the finely-tipped bougie catheter (Fig. 3) will enter more readily than those just referred to. Another good way of entering the bladder is to

pass the ordinary English red-webbing catheter armed with a stylet down to the point at which it meets the obstruction: by then withdrawing the stylet for about two inches and at the same time pushing the catheter gently forward, its tip, which the withdrawal of the stylet has thrown upward in the curve represented in Fig. 4, will surmount the median enlargement and often enter the bladder readily. If you cannot pass one of these forms of catheter, the chances are very much against your being able to pass any. The greatest advantage, besides that of adaptability to their purpose, of the above instruments is their freedom from danger. More serious trouble occurs through ill-advised and strenuous efforts to pass metal catheters with so-called prostatic curves than through any other interference. It is of frequent occurrence, I am sorry to say, to see cases of prostatic hypertrophy in which false passages have been made in the prostatic urethra by the injudicious use of metal catheters by physicians. If a false passage is made in this way it is generally situated at the anterior end of the prostatic urethra, at the point at which the prolongation of the third lobe into the posterior urethra is met with. When a false passage is made it announces itself generally by a more or less copious hemorrhage from the urethra following the withdrawal of the instrument, and also by the failure of the urine to flow through the instrument,—unless, indeed, the catheter has, as has sometimes happened, been forced upward through the prostatic enlargement, tunnelling it, and thus made to enter the bladder. If a false passage be formed it is frequently the source of septic infection of the patient, owing to the fact that it becomes filled with stagnant urine and decomposing pus for which there is no free drainage; and lastly, it often makes an insurmountable obstacle to further use of the catheter. It therefore constitutes a serious accident in the course of catheterism, which need never occur if the catheters of the kind I advise are used and properly used.

In regard to the *size* of the instrument, it is best to begin with one of moderate calibre, say No. 16 of the French scale, and if that meets with marked resistance, smaller sizes can be used until one is reached that will pass readily. A small instrument will sometimes excite spasm and fail to pass as easily as a larger one.

The best lubricant that I have found is *mineral glycerin*, although liquid vaseline or glycerin is perfectly good.

After the patient has been started favorably upon his catheter life he can be readily instructed, in most instances, in the use of the catheter himself.

On the treatment of urinary fever I can say only a word or two, as

it forms a subject by itself. It occurs in connection with this disease as with other diseases of the urinary tract. I shall only outline a few general principles. Chills should be combated by stimulants (and of these I prefer rum or whiskey) and by heaters. Morphine, which may be given in ordinary doses to younger patients, or to patients in whom there is no suspicion of kidney-disease or renal insufficiency, should in cases occurring with prostatic hypertrophy be used with caution, but may be beneficial if so used. All cardiac depressants should be carefully avoided. Digitalis may be given when there is no contra-indication and when the character of the pulse indicates its use.

It is a very common custom among physicians to treat patients with prostatic hypertrophy, who present symptoms of irritable bladder, with diluents and diuretics, such as citrate of potassium, various mineral waters, etc. If the residual urine is being drawn off regularly by the catheter the symptoms of bladder irritability may be relieved by the proper use of such means, but if the catheter is not being used regularly the patient's trouble is only being added to by diuretic treatment, for the reason that more water is poured into the bladder by the kidneys, and the pond of residual urine is consequently constantly increased.

A number of years ago a good deal was said in favor of the use of ergot and strychnine in cases of prostatic hypertrophy. By the use of ergot the gland was thought to be made to contract, and strychnine was said to give an increased power of expulsion to the bladder. I have never seen any marked effect from the use of ergot, except in the early or congestive period of the disease to which I have referred, and I cannot, therefore, say much in favor of its use. Strychnine has seemed to me to give some benefit in cases of atony of the bladder by aiding its expulsive power.

The treatment of cystitis when it coexists with prostatic hypertrophy is of much importance. More or less benefit may be expected to follow the use of certain internal medicines. Of these, those which I have seen work the most good are sandalwood oil in capsules, in doses of five to ten minims three or four times a day. It should always be borne in mind that with the larger doses of sandalwood oil there is a liability to renal congestion. I never like to employ in these cases sandalwood oil for a long period, but prefer to be on the safe side and interrupt the use of the drug for one or two days in every week, and not to continue it longer than four or five weeks at any one time consecutively. The following drugs sometimes do excellent work in rendering

the urine more clear and diminishing the bladder irritability in cases of cystitis: benzoate of sodium, acetate of potassium, each in doses of ten grains t. i. d., well diluted with water; the combination of a decoction of *ulmus fulva* and *succus hyoseyamus* is recommended by Reginald Harrison in the acute or subacute attacks of cystitis which frequently follow the first early use of the catheter. Mr. Harrison also speaks favorably in cases of chronic cystitis of the fluid extract of *sabal serrulata* (saw-palmetto) in doses of one drachm three or four times a day. The infusion of *pareira brava* is sometimes also beneficial. One other drug I have not infrequently found to produce strikingly beneficial results, and that is boracic acid, taken best in the form of pills, from three to six grains t. i. d. Under its use the urine may from being exceedingly foul become in the course of two or three weeks quite clear. An excellent regimen is a milk diet combined with the use of Vals water. Between two and three quarts of milk should be taken in the course of the twenty-four hours. The milk should be warm, and each tumblerful should be diluted one-quarter with Vals water. Boiled fresh fish and dry toast or Graham wafers may be allowed in the course of this diet. More important, however, is the local treatment of the bladder. Let me say at once in regard to bladder-washes that the attempt to cleanse the bladder by the use of the stronger antiseptics has proved in my hands, after thorough trial, to be distinctly deleterious. Not so, however, with the milder ones, and of these I have had the most beneficial results from the use of a four-per-cent. solution of boracic acid, or a one to four-thousand solution of permanganate of potassium. In the milder cases of cystitis the solution of borax and glycerin recommended by Sir Henry Thompson is admirable. Recently I have obtained in two cases of very obstinate and long-standing cystitis very marked benefit by the use of myrrh wash, beginning with a solution of the strength of the tincture of myrrh one part, water fifty parts, and increasing the strength up to one to sixteen.

The way in which bladder-washes are used is important. I have never seen any benefit result from attempts to distend small contracted bladders by forcible injection of fluids, as has been sometimes recommended. On the contrary, increased irritability has invariably resulted in my hands. The method which yields the best results is that recommended by Sir Henry Thompson,—viz., the injection (after emptying the bladder) of the fluid selected in quantities of from two to four ounces at a time, letting it run out again at once, and repeating this process until the returning fluid becomes clear. All bladder-washes

should be used warm, and oftentimes much additional benefit is gained by heating them to a temperature of from 110° to 120° F. In some cases of long-standing chronic cystitis with very foul urine, injections of a weak solution of nitrate of silver, one-half grain to one and one-half grains to the ounce, or of a solution of acetate of lead, sometimes work very well.

In the next lecture we will discuss the operative treatment of the hypertrophied prostate.

## THE RESISTANCE OF THE BLADDER TO INFECTION.

SURGICAL CLINIC AT THE NECKER HOSPITAL, PARIS.

BY PROFESSOR FELIX GUYON.

THE patient we desire to study to-day you will find in No. 19 bed, Laugier ward. She first came here last November, went out, and then came back to us in February. She is twenty-four years of age, and has no hereditary predispositions of interest. She came here simply because for the past three years her urine has been thick (exhibits a large deposit on standing, and smells badly). We examined her urine and found that it contained pus. The patient has no other functional symptoms,—no frequency in urination, no pain in passing water,—but she says that she has shooting pains in the right iliac region. This caused us to examine her, and we found in the right portion of the body of the uterus and adhering to it a large mass, which held on to the walls of the pelvis and had a prolongation going down to the bladder.

What connection can such a tumor have with the state of the urine? The endoscope gave us an answer to this question. As it lit up the bladder we found a small orifice on the right side, from which pus was escaping. Two months ago pus came away in considerable quantity when we pressed on the tumor, but now it is difficult to obtain any even after considerable pressure. So, then, there is a direct communication between this tumor and the bladder, but there are no signs of cystitis, as we usually see it. The aspect of the bladder under the endoscope shows that the mucous membrane is normal, the color being that of a healthy bladder, and when any instrument is passed around the surface of the bladder there is no sensitiveness. As to the sensation by distention, we passed four hundred and fifty grammes of water (nearly a pint) before there was the slightest sign or desire to urinate; she did not empty the bladder until it had received five hundred and thirty grammes: so that this organ is normal, and there is not the slightest