a.

b.

Rate 150

Rate 166

c.

PLATE XI.—(a) No. 98,618. July 28, 1917. Lead II. Rate 150. Nodal tachycardia. (b) No. 98,618. July 28, 1917. Lead II. Rate 175. Nodal and ventricular tachycardia. (c) No. 98,618. July 28, 1917. Lead II. Failure of vagus pressure.

a.

b.

c.

PLATE XII.—(a) No. 98,618. Aug. 1, 1917. Lead I. Rate 192. (b) No. 98,618. Aug. 1, 1917. Lead II. Rate 175. (c) No. 98,618. Aug. 1, 1917. Lead III. Rate 180.

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THE RECOGNITION OF SURGICAL KIDNEY*.

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SURGICAL kidneys are those whose symptoms can be relieved or cured by mechanical means. With some pathological conditions which fit into this group there may be a pre-surgical state where the fortunate physician may favorably influence the course of the disease. As yet we know less of the early symptoms of renal lithiasis, tuberculosis, and cancer than we desire. Of untreated surgical kidneys we have full knowledge from the autopsy table.

Some of the symptoms characteristic of surgical disease in the upper urinary tract are found with certain bladder conditions, and are also present when the real pathology is outside the urinary tract. They are often so concealed by misleading descriptions and contradictory symptoms on the patient's part, and by the vague and misleading names which are a part of our mental furniture, that we are easily persuaded to put them in the wrong pigeon-hole and label them pelvic, or orthopedic, or digestive, or even nervous, when they belong to the urinary department.

The separation of pathological lesions into things medical and things surgical is simpler than the proper sorting of the living men and women who bear this pathology. All agree that urinary stone is a surgical condition and usually operative. The same is true of cancer of the kidney and large hydronephrosis. All genito-urinary men, most general surgeons, and the majority of good medical men agree that renal tuberculosis is a surgical and operative disease.

There is less agreement about the type of

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renal disease characterized by pyuria, unilateral discomfort, and abnormal frequency, commonly called pyelitis, because this type is subject to periods of activity and of freedom from symptoms following any treatment by mouth, or no treatment whatever, and the last drug given before the quiet period gets the credit of a cure. Then, too, there is seldom any striking pathology that can be seen and handled after the cure or death of these cases. Patients with these symptoms are usually on their feet and often unwilling to allow for the period of study which is sometimes needed to establish this cause.

The symptoms which may reasonably turn our attention to the urinary tract are:

Frequent urination, which is real when the regular daily intervals are two hours or less or when there are two or more night urinations;

Blood, or pus, or both, in the bladder urine;

Urgency or incontinence;

Tenesmus after urination.

If with these we have recurring pain or discomfort in one loin or in one side of the back, we may suspect some trouble above the bladder. Variable temperature and loss of weight are suggestive additions, as is the presence of albumen in the urine. Albuminuria has been mentioned last because it is of minor importance in the diagnosis of surgical disease of the urinary tract, sometimes overlooked in the usual tests and usually varying in proportion to the amount of blood and pus in the urine.

Frequency is the relation of the working capacity of the bladder to the kidney excretion. Two ounces per hour is the expected excretion of the kidneys. If the total capacity of the bladder is four ounces, it must be emptied every two hours, and if less, more frequently. If the total capacity is twelve ounces and there is a constant residual of eight ounces, there is a working capacity of four ounces and a urinary frequency of two hours. When the bladder has a working capacity of sixteen ounces it is probably within normal limits and will retain urine for the eight hours of sleep and comfortably through the day unless the sphincter has been injured.

Any condition which increases the pull of the ureter or causes pressure on the outside of the bladder, like a pelvic tumor, will diminish the working capacity more or less according to the posture and activity of the body. Frequent urination is not a signal for operation, but it is a warning of more symptoms to come.

The presence of blood or pus, or both, in the bladder urine is most important, but the exact location of the bleeding or suppurating area is sometimes difficult to find. Blood and pus, even in microscopic amounts, are not normal in the bladder urine and always mean some pathological condition. The presence of either is a more serious symptom than moderate frequency, and the three combined more serious

yet. The probability of finding stones, tuberculosis, or new growth increases with the length of time this combination exists.

Incontinence, without the strong bladder contraction which we call urgency, seems to imply a weak sphincter from some injury or disease. This type of incontinence produces leakage with sneezing, coughing, and sudden jars without the previous sensation of desire to urinate. Urgency is the imperative desire to empty the bladder, produced by a powerful contraction of the bladder muscle, which will easily overcome an injured sphincter and may cause leakage through a sound one. Urgency seems to be associated with irritation of the bladder trigone or of the lower ureteral fibers. Tenesmus is a further exaggeration of urgency, continuing after the bladder is nearly emptied of fluid. It amounts to a cramp of the bladder muscle and is not rarely seen when examining a bladder through a cystoscope.

Pain in the back is commonly regarded by the public as a symptom of disease in the kidney. As a matter of fact, kidney diseases are painless unless there be obstruction to the flow of urine. Unilateral pain is a symptom of stone when the stone blocks the ureter, of tuberculosis and cancer when a clot is passing down, or intermittent hydronephrosis when the ureter is kinked, and of the acute infections when there are multiple retentions of urine within the kidney substance.

Variable temperature is often seen. In acute renal infection it may run very high and in old infection it may be persistently subnormal though variable. I have seen this several times, and have one chart kept by a careful patient for six weeks where the variations cover four degrees between morning and night, and the temperature did not rise above ninety at any time. A varying temperature may complicate the diagnosis. Loss of weight in renal disease of the surgical type corresponds with pain and loss of sleep, with accompanying lack of appetite. It is not essential to diagnosis and usually appears late. While these findings are essential to diagnosis of surgical disease above the bladder they are not the only ones demanded. Cystoscopy, study of the separate excretion of the kidneys by microscope and color test, guinea-pig inoculation, and x-ray examination may all be required before the diagnosis can be perfected. The conditions under which these symptoms may develop are pyelitis, hydronephrosis, stone, tuberculosis, and cancer of the kidney. To these we may add pyonephrosis and acute hemorrhagic nephritis. Most of these conditions are associated with infection, and the cause and path of the infection are important.

One function of the kidney upon which too little emphasis has been placed, in our earlier teaching, is the excretion of living and dead bacteria from the blood stream. When the

equilibrium between the intake and increase of bacteria, and their excretion and destruction, is upset by failure of any of the excreting and destructive systems we have health failure.

The kidney system, to work perfectly, requires free blood supply and exit, and a free channel for the urine. So far as known, the arterial supply is always adequate. No work has been done on the results of partial compression of the renal vein so far as I know. The relation between the right renal vessels and the foramen of Winslow is so close that inflammatory enlargement or adhesions around the lower bile duct may compress these vessels. The vein being less resistant will yield more to pressure, and by producing a passive hyperemia in the kidney may disturb its function somewhat. This is only a suggestion, not a conclusion.

We do know clinically and by numerous animal experiments that tying off the ureter is followed by marked dilatation on the venous side of the kidney circulation and slowing of the blood stream. If active bacteria are present in this blood we get a septic thrombus whose future history depends on many unknown factors. It may become the calcified nucleus of a stone, the beginning of a pyonephrosis, or disappear.

With intermittent obstruction of the ureter we may assume a lesser degree of the same anatomical changes, and the bacteria, white and red blood cells, and some round cells from the fighting area give us the sediment picture of what we call pyelitis. If the bacteria are of a virulent type we may get a more acute general reaction, with high temperature, acute pain, prostration, and a sediment showing leakage into the urinary tubules—the acute hemorrhagic nephritis.

The word “hydronephrosis” is now applied to all cases where pain is caused by the retention of urine in the pelvis. A half-ounce may produce severe pain in one individual when another may carry a pint or more and continue work. Much of our knowledge of these smaller hydronephroses is due to their study by x-ray plates with opaque fluids in the pelvis. A symptom suggesting this diagnosis is the absence of one-sided kidney pain after lying down and its reappearance a half-hour to an hour after rising. Many hydronephrotic kidneys drain well when horizontal, but when the owner stands or sits the ureter is kinked, and pain comes on when the kidney has secreted enough urine to distend the pelvis. This symptom is more common than repeated urination after lying down.

Stone in the kidney causes pain only as it blocks the flow of urine, and stone in the ureter causes reflex irritation but not much pain unless it plugs it tightly. X-ray plates have shown many urinary stones that were unexpected and, unfortunately, have failed to show some that were present.

It is usually possible by some means to make a correct diagnosis in cases of renal and ureteral stone, though not always; but it is always possible to make the diagnosis of renal obstruction if such exists, and this is the condition for which the patient seeks relief.

Tuberculosis of the kidney is really not an uncommon disease and should be recognized earlier than it is. Its natural course varies much. I have known two patients to die within four years of the first recognized symptoms, and others whose symptoms could be traced back for six years before I saw them. Often the earliest sign which leads a patient to a doctor is a swollen epididymis which is itself infected from the stream of bacilli flowing through the prostatic urethra. Another will have albuminous urine and urinary frequency, another a hematuria, and another have recurring periods of acute bladder symptoms.

A correct and early diagnosis of renal tuberculosis is desirable, and possible except under two conditions. If the specimen of urine is obtained at a time when no bacilli are coming through, or if the tubercular kidney is blocked and excreting no urine, of course we get no bacilli. The guinea-pig test is more delicate than the microscopic examination of the sediment, but, if negative, should be repeated several times if the patient's condition suggests renal disease of this type. The smegma bacillus is the only similar one likely to contaminate a urine, and I do not always wait for the six weeks guinea-pig test when I can obtain the specimen of urine myself and the microscopic examination is positive.

A tubercular kidney is hopeless. There is no evidence from the autopsy table of recovery. Nature sometimes does a sort of nephrectomy by closing the ureter and thereby stopping excretion from this kidney. Apart from this possibility, tuberculosis of the kidney will kill its possessor as surely as cancer of the kidney and give him more misery on the way. It is as necessary to operate early for tuberculosis as for cancer; for late cases have such secondary changes in their bladders that much of their discomfort remains after the cause has been removed, while the comparatively early cases get entire relief from symptoms almost as soon as they waken from the operation. Early recognition and nephrectomy is the proper and only fair method of caring for these cases.

The recognition of surgical kidney is slower than it should be in every community. Too many physicians still treat patients for bladder symptoms without studying into the cause of these symptoms. If we remember that one function of the bladder is to serve as indicator of disease above and below it and that it is more frequently an indicator than a primarily diseased organ, we shall recognize our cases of renal tuberculosis, lithiasis, and all degrees of pyelitis and pyonephrosis more frequently and much earlier.