The Boston Medical and Surgical Journal

TABLE OF CONTENTS

October 6, 1921

ORIGINAL ARTICLES

- NON-TUBERCULOUS PYELONEPHRITIS. *By Arthur H. Crosbie, M.D., Boston.* 397
- SUBLUXATION OF THE SHOULDER—DOWNWARD. *By Frederic J. Cotton, M.D., Boston.* 405
- MENTAL RESPONSIBILITY AND PETTY CRIME. *By D. A. Thom, M.D., Boston.* 407
- THE SURGICAL TREATMENT OF ULCER AND CANCER OF THE STOMACH. *By F. B. Lund, M.D., F.A.C.S., Boston.* 413

CURRENT LITERATURE DEPARTMENT

- AN APPARATUS FOR FRACTURES OF THE HUMERUS WHICH ASSURES MOBILITY OF THE ELBOW. 417
- IDEOPATHIC DILATATION OF THE ESOPHAGUS. 418
- JEJUNAL ULCER—POSTOPERATIVE. 418
- HABITUAL OR RECURRENT DISLOCATION. 418

BOOK REVIEWS

- Aids to Chemistry. *By William Partridge, F.I.C.* 418
- Injuries of the Peripheral Nerves. *By Henry S. Souttar, C.B.E., F.R.C.S., M.Ch., and Edward W. Twining, M.R.C.S., L.R.C.P.* 418

EDITORIALS

- ANTITYPHOID VACCINATION. 419
- THE ANNUAL MEETING OF THE NEW ENGLAND SURGICAL SOCIETY. 419
- A SUPREME COURT DECISION RELATING TO PHYSICIANS. 420
- THE SOCIETY FOR CINEMATOGGRAPHIC INSTRUCTION IN MEDICINE AND SURGERY. 422
- ANTI-VACCINATION AND THE OSTEOPATHIC SOCIETY. 423
- MEDICAL NOTES. 423

CORRESPONDENCE

- NOMINATION OF MEDICAL SOCIETY OFFICERS. *Frank E. Bateman.* 425
- PLACE OF MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY. *Max Baff, M.D., F.A.C.P.* 426
- CANCER BY TALBOT. *E. A. Codman, M.D.* 426

MISCELLANY

- INSTRUCTIVE DISTRICT NURSING ASSOCIATION. 424
- SOCIETY NOTICES. 425
- NOTICE, ERRATUM, ETC. 426
- OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY. Adv. Sect. iv
- STANDING COMMITTEES AND OFFICERS OF THE DISTRICT SOCIETIES. vi

Original Articles.

NON-TUBERCULOUS PYELONEPHRITIS.*

By ARTHUR H. CROSBIE, M.D., BOSTON.

UNDER this heading I will consider the suppurative diseases of the kidney,—pyelitis, pyelonephritis, and pyelonephrosis. Personally, I feel that a simple pyelitis is very rare. Most cases that are called pyelitis are really pyelonephritis, that is, the inflammation is not confined to the lining of the kidney pelvis, but extends up the tubules. Take the so-called pyelitis of children. I feel very sure that this is practically always a pyelonephritis; the same is true of pyelitis of pregnancy.

Pyelonephritis is a much more common disease than most of us realize. I have made no attempt to tabulate its frequency, but I picked up at random, one hundred of my histories that were laid aside to be filed and found that in this hundred cases there were eighteen cases of pyelonephritis.

There are all grades and degrees of pyelonephritis, varying all the way from the person whose only symptom may be slight burning on micturition and only an occasional leucocyte in the urine up to the person who has profound prostration, with chills and fever and much pus and bacteria in the urine.

* Read before the New Bedford Medical Society, New Bedford, Mass., April 11, 1921.

WHAT IS PYELONEPHRITIS AND WHAT IS ITS ETIOLOGY?

Pyelonephritis is a diffuse inflammatory process in the kidney due to the invasion of a microorganism. The inflammation affects, as a rule, the lining of the pelvis of the kidney and the kidney tubules extending frequently all the way to the cortex, but rarely affecting the glomeruli. In the severe cases, there are multiple pin-point abscesses, as you may well see in the kidney that I present for inspection and also on the lantern slides. In this specimen you can see that the lining of the pelvis is thickened and there are small abscesses all through the kidney and on the kidney surface. Pyelonephritis, or "infectious nephritis," as Mallory prefers to call it, differs very markedly from acute Bright's disease, both pathologically and clinically. In Bright's disease, the glomeruli are attacked, whereas in pyelonephritis they are spared. This is the reason why the symptoms are so different and the prognosis, as I will show later, is so much better. In Bright's disease, the function of the kidney is much more disturbed, leading to oedema, which is not seen in pyelonephritis, unless the process is very advanced and the destruction of the kidney tissue is great.

In the ordinary case of acute pyelonephritis, there is little or no destruction of kidney tissue, and pyelograms are negative. If, however, there is obstruction to the outflow of urine, either something such as an aberrant vessel or a deformed kidney pelvis that prevents the

ACUTE HEMATOGENOUS KIDNEY SHOWING MULTIPLE ABSCESSSES.

INTERIOR VIEW OF ACUTE HEMATOGENOUS KIDNEY SHOWING MULTIPLE ABSCESSSES.

KINK IN URETER CAUSING HYDRONEPHROSIS.

complete emptying of the kidney pelvis or obstruction lower down, preventing the emptying of the bladder, the pyelonephritis will persist in repeated attacks until the pelvis and calyces become dilated and we have the condition known as hydronephrosis and pyonephro-

sis. Continued obstruction of this sort will eventually lead to the entire destruction of the kidney. Theoretically, one would suppose that perinephric abscess would be common in pyelonephritis, especially in a kidney such as the one shown tonight, where there are so many small abscesses on the surface of the kidney. On the contrary, the condition is rare with pyelonephritis. My feeling is that perinephric abscess is due to an infarct near the surface of the kidney and the abscess formed breaks through the cortex of the kidney rather than into the pelvis. This would account for the fact that so often in perinephric abscess the urine has no leucocytes and is sterile.

Etiology. Almost any of the pus-producing organisms may cause the disease. The most common one is the colon bacillus. The proteus vulgaris is occasionally found, and this urea-splitting organism can produce a very foul pyelonephritis. There has been much discussion as to how the organisms reach the kidney, but I think that most observers agree that for the most part they are blood borne. That an ascending infection may occur I am sure we must all admit, but I believe this is only possible in case of a much dilated ureter, due to back pressure of residual urine. We not infrequently see such cases as one that I will show on the screen, where in taking cystograms the fluid injected, even if the amount is not large, runs up a ureter and fills the kidney pelvis. In the case I will show on the screen the man had had a tremendously overdistended bladder, due to a stricture, and the left ureter had become greatly dilated. With only 150 c.c. of barium solution in the bladder, the solution filled the left ureter and ran into the kidney pelvis. Now it stands to reason that with an infected urine, such as these cases are apt to have, it would be perfectly possible for the infected bladder urine to bathe the renal pelvis. However, as I said before, it seems to me that the most logical explanation of the source of infection is from the blood stream. I think that many times the infection starts from the lower urinary tract and passes through the blood to the kidney. Take, for example, the chills and fever that one occasionally sees after the passage of sounds. I think here the sound causes a break in the mucous membrane of the urethra and organisms are absorbed into the blood and pass to the kidney, giving an acute pyelonephritis. Of course, the lymph stream is a possible source, but it does not sound plausible to me.

Under the etiology, it might be well to speak of some of the predisposing factors that lead to pyelonephritis. Lowered resistance from overwork, lack of exercise, exposure, neglect of the bowels, etc., are apt to be factors. There is no doubt but colon bacilli and other organisms frequently find their way into the blood stream from the intestine and other places, and

BARIUM SOLUTION PASSING FROM BLADDER UP DILATED LEFT URETER.

are excreted through the kidneys of healthy people without the formation of lesions. If, however, a person is below par, or if the kidneys themselves are below par, the bacteria may lodge and produce an inflammation. Anything that interferes with the outflow of urine from the kidney, such as kinked ureter causing hydronephrosis, stricture of the ureter, pressure on the ureter, such as you get in pregnancy, stone in the kidney or ureter, obstruction to the outflow of urine from the bladder, causing back pressure of the kidney, renders a kidney very susceptible to infection. This is why pyelonephritis is such a common accompaniment of strictures, obstructing prostates, pregnancy, etc.

The symptoms of pyelonephritis depend entirely upon the severity of the inflammation. The only symptom may be slight burning on micturition. There are all grades, from the person with practically no symptoms up to the one with chills, fever and profound prostration. In a great many cases, the symptoms are entirely referable to the bladder. As a rule, the most prominent symptom is frequency. This may be so severe as to amount to strangury. I am sure that a great many times a diagnosis of cystitis is made without complete investigation, where the trouble is really a pyelonephritis.

A primary cystitis is rare, in fact, I have a feeling that it never exists. I am sure that it always is secondary to a kidney infection or due to urethritis, obstruction of the outflow of urine from the bladder, or stone or new growth in the bladder. Every case of cystitis, especially in women, should be considered as secondary to kidney infection until it is proved to the contrary.

Pain in the kidney is a variable symptom. Even if the inflammation is very extensive, and one or both kidneys considerably enlarged, pain may not be a prominent symptom. If, however, there is much pus and mucus passing down the ureter, the pain may be colicky and very severe, exactly the same pain produced by the passage of a calculus. I feel that sometimes a ureter becomes completely blocked with pus and mucus. This, I think, accounts for the fact that sometimes when the patient is in greatest distress the urine may be clear, with only a few leucocytes present, whereas a few hours later, the patient may be much more comfortable and have a drop in temperature, and yet the urine be full of pus.

Chills are frequent and often are the first sign of trouble. Frequently a person in apparently good health is seized with a severe chill and fever, with no other symptoms, and

BARIUM SOLUTION IN LEFT KIDNEY HAVING PASSED UP URETER FROM BLADDER.

the diagnosis is only made by examination of the urine and the findings of pus and bacteria. Often a person has recurring chills, and the condition is not infrequently mistaken for malaria.

In the mild cases and in the chronic cases, there may be no fever, but in the acute, severe ones the temperature is elevated and is frequently high, the evening temperature sometimes rising as high as 105° .

Hematuria is common in the acute stage of the disease. It may amount only to microscopic blood or it may be severe enough to make the urine look like pure blood. As a rule, the hematuria is of short duration. About a year ago, I saw a Catholic priest, forty-eight years of age, who had been in apparently good health, except that he was feeling tired and run down. He had had no urinary trouble. He was waked out of a sound sleep by severe pain in the right side, a chill and a desire to urinate. When he passed his urine, he noticed that it looked like pure blood. When I saw him, next morning, his urine was very bloody and he was having colicky pains in his right side. My thought was renal calculus. He was sent to the hospital, where x-rays were negative. Under forced fluids and alkalis, the blood soon disappeared.

Urethral catheterization, done after the acute attack subsided, showed leucocytes and colon bacilli from both sides, more marked on the right. Pyelograms were negative. He quickly cleared up, and has had no further trouble.

There is always pus in the urine in varying amounts. Casts may or may not be present, and sometimes pus casts are seen, but as a rule, there are few or no casts. The amount of albumin is not so great as in acute Bright's disease, and the urine is not so scanty.

Examination. One thing that has often surprised me in cases of acute pyelonephritis is that the patient did not look sicker. I remember, in particular, one girl in the early twenties, with the disease very acute, the right kidney large and slightly tender, with pus in the urine, and evening temperature up to 105° for a week, but at no time did she look or feel sick. Her main complaint was that she wanted beefsteak, which was not allowed. I think this is very often the case, that during the early part of an attack the patient does not look so sick as one would expect from the bedside chart. This is often true in the pyelonephritis of children. Frequently there is little to show for the child being sick, except the temperature and the pus in the urine. I have just been observing a woman with pyelonephritis of preg-

KINK IN URETER CAUSING HYDRONEPHROSIS AND PYELONEPHRITIS.

nancy, who had an evening temperature of 103° to 104° each day for two weeks. After the first two or three days, when she had chills and considerable pain, she did not feel sick and did not look sick. It was only with great difficulty that we were able to keep her in bed until her temperature dropped. On the other hand, a patient in which the process has been long continued, such as we get in some cases of pyelonephritis of pregnancy, may look very sick and have marked cachexia. In the severe cases, this continues progressively until the uterus is emptied.

If the amount of fluid taken in has been small, the tongue is apt to be dry and coated. Palpation may reveal some tenderness and spasm over one or both kidneys. Sometimes in even a very acute case, there is none. Both kidneys are usually affected, though one, as a rule, more than the other. There is apt to be a little tenderness as the costovertebral angle, and this is an important place to feel, as it is here we would detect a perinephric abscess.

Examination of the urine always shows pus and the offending organisms. As I have stated before, casts may or may not be present. At some time during pyelonephritis, urethral catheterization should be done and the divided urine examined and cultured, and pyelograms

made. I prefer, as a rule, to wait a few days before passing any instruments into the bladder. The reason for this is that it adds greatly to the patient's discomfort. Most cases respond so readily to treatment that this can safely be done. Occasionally, one is seen who is having so much colic from the passage of pus and mucus that the passage of a catheter with gentle lavage of the kidney pelvis, will give relief. Cystoscopic examination during the acute stage may show a very marked cystitis. Frequently you get the so-called beef-steak bladder. This generally clears up as the process in the kidney subsides.

Treatment. In the first place, remember that acute pyelonephritis tends to get well. It is tremendously important to bear this in mind. I feel strongly that a great many so-called acute hematogenous kidneys are removed that would get well if left alone. The process is generally double, though, as I said before, it is usually worse on one side than the other. If one kidney is removed, it leaves an impaired kidney on the other side. I will admit that when one cuts down on one of these acute hematogenous kidneys it looks very bad, covered as it is with small yellow abscesses. Very rarely one may become gangrenous and have to be removed, but my feeling is that it is ex-

NORMAL KIDNEYS AFTER AN ATTACK OF ACUTE PYELONEPHRITIS.

tremely rare. Brewer, in the cases he reported in 1906, must have run into a very severe epidemic, and I am afraid it has influenced some surgeons to be too hasty about removing acute kidneys. I present to you, tonight, a sample of the acute hematogenous kidney that I admit looks pretty bad, with its miliary abscesses all through the kidney substance and over the surface of the kidney. This kidney was removed several years ago by a very prominent Boston surgeon, and I remember that when he saw the kidney cut open, he remarked that it was a good thing we operated early. The operation was done on the second day of the attack. I feel perfectly sure that the patient would have got well and would have a good functioning kidney on her right side today if this kidney had been left in. Of course, not a perfect kidney, for no one can conceive of the resolution of all those abscesses without some destruction of kidney tissue, but a useful kidney, nevertheless.

I wish to present, also, in connection with this kidney, the history and chart of a woman with pyelonephritis of pregnancy. The infection in this woman started first on the left side. She had chills and fever, and the left kidney was enlarged and tender. After a few days the pain, tenderness and swelling disap-

peared from the left side, and then the right kidney started up worse than the left. The patient had frequent chills and pyrexia. There was considerable nausea and vomiting. She was steadily going down hill. She finally reached a point where it was evident that the only thing that could save her was emptying the uterus. As she was a Catholic, an abortion was not permitted. Finally, the spasm and tenderness over the right kidney was so great, that there was a question of there being a perinephric abscess. Hoping that I might find this condition, and give her some relief, I cut down on the right kidney under novocaine, and found no pus outside the kidney, but I did find a kidney that looked exactly like the one I have shown tonight. It was large, and the surface was covered with small yellow spots. It certainly looked like a hopeless kidney. Knowing that the left kidney was infected, a nephrectomy was out of the question, even had I thought it advisable. I merely decapsulated the kidney and closed the wound with drainage. She seemed to get a little relief from the operation, but nothing very marked. She still was failing and continued to do so until she miscarried. As soon as the uterus was emptied, her temperature fell, and her improvement was rapid. Within three weeks the urine, which

tion by hypodermoclysis every eight hours, and all the fluid possible by mouth, until the output had been raised to 175 ounces in twenty-four hours. She at once began to show improvement and, as you can see on her chart, the temperature gradually fell to normal and the kidney diminished in size until at the time of her discharge from the hospital, the kidney could hardly be felt.

What I wish to bring out by the foregoing cases is that the treatment of acute pyelonephritis is not operative. As I will bring out later, some cases of chronic pyelonephritis do need operative interference.

The one most important thing in the treatment of acute pyelonephritis is forced fluids. I am never satisfied until the output exceeds one hundred ounces in twenty-four hours. It is well, at first, to get under way, especially in severe cases, with hypodermoclysis. Until the temperature is normal, the patient should be confined to bed and kept on a bland diet. I usually restrict meat at first. The diet does not need to be so strict as in Bright's disease, as the function of the kidney is not so much disturbed. It is important to keep the bowels open. Medication is not so important as forced fluids, but there are some things that help. If the infection is by the colon bacillus, the alkalies are of help. The colon bacillus does not thrive in alkaline urine. Large doses of potassium citrate should be given until the urine becomes alkaline. After the acute stage is passed, hexamethylenamine may be used. If the infection is other than the colon bacillus, hexamethylenamine can be used from the start.

As I mentioned elsewhere, if there is a great deal of renal colic, the passage of a urethral catheter, with gentle lavage of the kidney pelvis, often helps.

After the acute stage has passed, all cases of pyelonephritis should be investigated, ureter catheters should be passed and urine collected for examination from both sides, and pyelograms of both kidneys should be made. The reason for this is to discover whether there has been any destruction of the kidney and to discover if there is any abnormality, such as a kinked ureter, or stone, or tumor, to prevent the process clearing up. Acute pyelonephritis tends to get well. If a case becomes chronic, there is generally some obstructive lesion to account for it. If in investigating a chronic case, any obstruction to the flow of urine is discovered, it should be attended to, as there is danger of complete destruction of the kidney if it is not. An aberrant vessel kinking a ureter is one of the most common causes of pyelonephritis continuing. These usually can be detected by filling the kidney pelvis with 25% sodium bromide or thorium and taking an x-ray with the ureter catheter in. The catheter is then withdrawn three or four inches and another radiograph taken with the patient holding a full

breath. It is well to inject three or four c.c. while the radiograph is being taken. This gives you the excursion of the kidney and generally reveals a kink, if there is one there.

If no abnormality can be found, most cases of chronic pyelonephritis can be improved and some cured by pelvic lavage. For this I formerly used a fairly strong solution of silver nitrate, but recently I have been using mercurochrome 2½%. I have had much better results with the mercurochrome. It is especially good when the condition is really nothing more than a bacilluria. I have a woman in mind who had an acute pyelonephritis eleven years ago. Ever since, she has had frequent and painful micturition. The urine from each kidney showed only a rare leucocyte, but a profuse growth of colon bacilli. Pyelograms were negative. After two treatments, at intervals of three weeks, she is entirely relieved of symptoms for the first time in eleven years. The method I use is to inject four or five c.c. of mercurochrome and then plug the catheter for five minutes, and then withdraw the catheter, leaving as much in the kidney pelvis as possible. In the chronic cases where there is not much destruction of kidney tissue, I do not hesitate to wash out both kidneys at the same time. If there is much destruction, it is better to do so one at a time.

Occasionally, one sees a case of pyelonephritis where there is no apparent obstruction to the outflow of urine where one or both kidneys have been badly damaged. I present here the pyelograms of such a case. On the right side there is a nephroptosis with marked kinking of the right ureter and much destruction of kidney tissue. On the left, however, there is no apparent obstruction to the outflow of urine and yet, as you can see, there is marked blunting of the calyces and dilatation of the kidney pelvis. The urine from both kidneys contains much pus and many colon bacilli. I have already operated on the right kidney, freeing up the kinked ureter, stitching the kidney back in place, and doing a nephrostomy, leaving a tube through the kidney to the kidney pelvis. Nephrostomy, with drainage of the kidney for a week or ten days, often helps a great deal to lessen the inflammation. Of course, the actual destruction that has taken place can never be repaired.

To summarize briefly:

1. Treat acute pyelonephritis expectantly.
2. Force fluids to the utmost.
3. Do not operate until you are sure of the necessity.
4. All cases of pyelonephritis should be thoroughly investigated after the acute symptoms have subsided.