

THE ETIOLOGY AND TREATMENT OF CYSTITIS IN WOMEN.*

By F. Webb Griffith, A.M., M.D.,
Asheville, N. C.

The term cystitis has been used to designate every pathological condition of the bladder from mere hyperaemia to carcinoma. So many of the pelvic disorders have as a symptom bladder disturbance that we are prone to overlook the underlying cause and treat the bladder symptomatically.

I shall discuss only a few of the gynecologic diseases which may give rise to symptoms resembling more or less closely cystitis.

First, pelvic inflammatory disease. By pelvic inflammatory disease I mean that clinical picture which we so frequently see when there is inflammation of the pelvic organs, varying from a slight salpingitis to an inflammatory mass matting together all the pelvic viscera. It is no wonder that bladder disturbance occurs in most of such cases, for when we consider how extensive are the perivesical adhesions it is a wonder we do not get it in every case.

Usually the symptoms are due to a mechanical action upon the bladder and a perivesical inflammation, but in some cases, as I shall show later, the same organism can be isolated from the bladder and the inflammatory mass.

Malposition of the uterus, fibroids, ovarian and parovarian cysts, pregnancy and relaxation of the vaginal outlet are mentioned as causes of bladder disturbance due to mechanical means.

The vermiform appendix adherent to the bladder is occasionally the cause of obscure symptoms. So also an extension anteriorly of an advancing carcinoma of the cervix. The symptoms arising from these conditions resemble cystitis only in a vague sort of way and a most cursory examination should reveal the underlying cause. When we have a patient complaining of symptoms referable to the bladder a thorough abdominal and pelvic examination should be made to exclude extravesical causes. Then the ordinary examination of the urine should be made. If that shows pus and albumen, a catheterized specimen should be obtained to be sure there is no contamination with the vaginal discharge. If there be neither pus nor albumen in the urine, the physician is justifiable in treating the patient symptomatically for a short time. If, however, there be pus in the catheterized urine a thorough cystoscopic examination is es-

manded. If the symptoms be very acute, it may be wise to wait a few days; however, instrumentation during the acute stage of a urethritis or cystitis is not so greatly contra-indicated in women as in men. True cystitis is practically always of bacterial origin. An inflammation of the bladder due to mechanical or chemical agents does occur, but it is by far the exception and as a working basis may be practically disregarded.

Trauma, hyperacid urine, or anything else which might cause hyperaemia, are predisposing causes, but the exciting cause is the infection. Any pyogenic bacteria may be the cause of a cystitis, but as a matter of fact we know that over 90 per cent of the cases are due to six or eight organisms. On the other hand, we know that frequently there is a bacteruria without cystitis, and only after a predisposing cause has paved the way does infection take place.

A fairly large experience in charge of the gynecological bacteriology at the Johns Hopkins Hospital showed that the organisms most frequently found are *B. coli communis*, the various staphylococci, gonococcus, tubercle bacillus, streptococcus, proteus vulgaris, and *B. lactis aerogenes*. I have never been fortunate enough to find *B. pyocyaneus*, *B. typhosus* or the pneumococcus as described by some writers. As the gonococcus and the tubercle bacillus will not grow on the ordinary media they are frequently overlooked. If, however, blood-serum, hydrocele agar, Dorsett's egg media or some other suitable material be used, many of the negative cases will be cleared up.

Unfortunately the tubercular cystitis has grafted upon it a secondary infection which renders cultural growth of it almost impossible. If, however, the urine be first treated with antiformin long enough to kill the secondary organisms and then cultures made upon proper media, the bacillus can occasionally be grown. The use of antiformin is also of value in killing off the secondary organisms before animal inoculation for suspected tuberculosis. By that means the animal is not killed by the secondary organisms and the tubercle bacillus has a chance to act. The *B. lactis aerogenes* I have found twice. This organism is claimed by some to be a very rare cause of cystitis. Because of its close resemblance to the colon bacillus I believe it is frequently confused and diagnosed as a colon infection. As a matter of fact we are not sure that this organism is not a form of the colon bacillus. However, it has some characteristics which differentiate it from the typical colon bacillus, the most prominent of which is the peculiar lemon-yellow growth upon

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potato with little bubbles of gas. Of the proteus group the only one I have gotten has been the vulgaris of Hauser.

Before leaving the question of etiology I wish to discuss briefly post-operative cystitis. Following pelvic operations many patients have symptoms resembling cystitis. In the great majority of cases this is not a true cystitis. Urinalysis will show no pus, at the most a few leucocytes. Cystoscopy reveals only mild hyperaemia. If the woman is catheterized repeatedly by one who is careless about the details of asepsis, of course she runs great risk of infection, but that can hardly be charged against the operation.

Most pelvic operations influence the bladder more or less. A round ligament suspension of the uterus draws it higher up in the abdomen. Covering over the amputated cervix with peritoneum frequently puts the bladder on undue tension. Pan-hysterectomy necessitates trauma of the bladder in separating it from the cervix. These will of themselves cause manifold bladder symptoms and also are the predisposing causes of a true cystitis. For that reason during operation the bladder should be submitted to as little insult as possible.

Sometime ago in order to collect data on post-operative cystitis I took routine bladder cultures from the gynecological patients at the Johns Hopkins Hospital just before operation. The technic was as follows: The perineum was shaved and scrubbed with green soap and water and then with bichloride. Then with a sterile gauze on a sterile clamp the vagina and external urethral orifice were cleansed with green soap, bichloride and alcohol. A small glass catheter was introduced and after the first portion of urine had run off specimens were collected into tubes of media. There is a possibility that organisms may be carried from the urethra into the bladder by the catheter and thus contaminate a sterile urine. So that were I to do the experiments over again I would have two catheters made, one small enough to pass through the other. The larger could be inserted almost to the internal urethral orifice and the smaller then passed through it into the bladder. In this manner the danger of contaminating the cultures from the urethra would be reduced to a minimum. The result of our investigation was as follows: In the great majority of cases when the patient complained of post-operative vesical symptoms, there were no organisms found either before or after the operation and microscopic examination of the urine showed no pus. In other words, they were not true cystitis. In some instances we found bacteria either before or after operation where there were

no symptoms of cystitis, as example, Miss L. C. (white). On admission there were no urinary symptoms. In fact, patient stated that she could go forty-eight hours without urinating. The operation was left salpingo-oophorectomy and right salpingectomy for chronic pelvic inflammatory disease. Examination before and after operation showed no pus or albumen. Routine cultures from bladder just before operation showed *B. coli* communis. Such cases may be a contamination from the urethra or else a true bacteriuria.

It was very unusual to get a true cystitis following operation when the cultures were negative before operation. Now and then we isolated the same organism from the bladder and from the inflammatory mass for which we were operating, as example, N. H. (colored). On admission complained of slight pain and burning on micturition. Urine before operation contained moderate pus, few red blood cells, no casts. The operation was incision and drainage of a pelvic abscess through the vagina. Routine cultures from the bladder taken a few minutes before the operation showed staphylococcus aureus. Cultures from the pelvic abscess showed the same organism. The patient also had a pyometra, but it was considered wiser to wait two weeks longer before doing a hysterectomy.

I believe that in a fairly large proportion of cases diagnosed post-operative cystitis, the cystitis really antedates the operation and the worst that can be said against the operation in such cases is that it flares up a latent inflammation.

Paradoxical as it may seem, the treatment of a cystitis should in many cases precede the cystitis, in other words, prevention. If we maintain the same respect for the bladder that we do for the abdominal cavity, our cases of cystitis will be far fewer. Even with every precaution, we will once in a while get a cystitis for which we are responsible. How much more frequently they will occur when we become lax in our asepsis. To diagnose gastric ulcer, typhoid fever, appendicitis and other inflammatory conditions of the gastro-intestinal tract under the one term gastro-enteritis and treat each with the same stock remedy would be irrational to say the least. Yet that is pretty nearly what we are doing with our cases of cystitis. The urologist has at his disposal means of exact diagnosis which are more precise than those of the gastro-enterologist, and we should make use of them.

Thus our cases should be designated as tubercular cystitis, colon cystitis or staphylococcus cystitis as the case may be, and not merely the vague term cystitis.

When we have made an accurate diagnosis we are a long ways toward successful treatment. The mild cases will usually clear up with plenty of water and some alkaline diuretic, such as potassium citrate and hyoscyamus or belladonna. With that it is well to give also hexamethylenamin from 15-40 grains daily. Absolute rest in bed with the bowels kept moderately loose will hasten recovery. Hot vaginal douches during the acute stage are often comforting. If the dysuria and increased frequency are so marked as to interfere with sleep, sedatives should be given freely. As the acute symptoms subside, irrigations and instillations are valuable. The drugs recommended for this purpose are numerous. Personally I like an irrigation of $\frac{1}{2}$ saturated solution of boric acid (2 per cent) twice a day, with semi-weekly irrigations of silver nitrate 1-5000, gradually increasing in strength. For the instillations protargol 2 per cent or argyrol 10 per cent work nicely. When there are isolated areas of inflammation, direct topical application through the air cystoscope is valuable.

The condition known as cystitis coli is really a mild inflammation about the internal urethral orifice and trigonum, and is probably of gonorrheal origin. While the symptoms are not very severe, they are persistent and annoying. Cystoscopic examination in these case shows very little, for the hyperaemia caused by the trouble is often no greater than that caused by the slight irritation of the cystoscope.

It must also be remembered that the trigonum is normally more injected than the rest of the bladder. Direct application of 10 per cent silver nitrate solution once or twice a week are valuable and should be followed up by alkaline diuretics.

Occasionally the severe cases of non-tubercular cystitis will require the formation of a vesicovaginal fistula with continuous irrigations for several hours daily in a tub of warm water before relief is obtained. In conclusion, just a word about tuberculosis of the bladder. To diagnose and treat vesical tuberculosis without further investigation is criminal, for tuberculosis of the bladder in women is almost *prima facie* evidence of tuberculosis of the kidney.

After the renal infection has been properly treated, the bladder will tend to clear up. Irrigations of bichloride 1-5000 or instillations of 1-500 and stronger, silver nitrate in weak solutions or 10 per cent iodoform emulsion in glycerin are helpful. Excision of ulcers or even curettage of the bladder is advisable in some cases. To these local measures should be added climatic, hygienic and

dietetic treatment. If we will give our cases of genito-urinary tuberculosis the advantages where they can be out of doors most of the time, sleep out at night if necessary, regulated exercise and proper attention to diet, we can change the hopeless prognosis which we formerly gave to one of encouragement. The internists are doing wonders for early pulmonary tuberculosis, and we as surgeons should profit from them and give our cases of surgical tuberculosis the benefit of the same methods.

DISCUSSION.

Dr. Winthrop, Mobile, Ala.—As Dr. Griffith has shown, cystitis occurring after operation, unless it be from some foreign material introduced into the bladder—most commonly a catheter—is a rather uncommon occurrence. Still, the bladder after operation is in a condition quite susceptible to the introduction of infection from without from the trauma and manipulation of the bladder during surgery.

I think we do not pay sufficient care to post-operative catheterization. We are too prone to have patients catheterized when other and safer methods would achieve the same end.

I find in most hospitals it is in routine to catheterize the patient eight to ten hours after laparotomy or pelvic operation. Hot packs and other means are often sufficient to cause the patient to start her own urine, and we get the same results without catheterization. My experience is that a hospital catheterization is, as a rule, the cause of these post-operative cases of cystitis.

In the treatment of cystitis, particularly in men, I think a cystoscopic examination is a most valuable aid to the treatment. In acute cystitis, complicated with urethritis, I deem it unwise to introduce the cystoscope. In the female, however, the same objection does not obtain, and by means of a cystoscopic examination we can so thoroughly determine the extent and localization of an inflammatory process that our treatment is very greatly aided thereby. I think a routine examination of this kind is not sufficiently practiced.

I would like to ask Dr. Griffith and other members of the association what experience they have had in the use of the stock or autogenous vaccines in the treatment of cystitis?

The question of the use of these vaccines has been rather widely brought forward in the literature. I have tried them in several cases with absolutely no result, and I would like to know if other men have had the same experience as I.

Dr. Griffith (closing).—I have had no experience with vaccines. On one or two occasions I have intended to try them, but the reports have been so discouraging that I have not done so. I use every means to get the patient to void, rather than catheterize. Hot cloths over the bladder, warm enema, or even propping the patient up may suffice. Another method that has been used is the injection into the urethra of 10 c.c. of a 10 per cent boro-glycerin solution, and that quickly stimulates the urethra so that the patient urinates.