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SOME RESULTS OF MICROBIC INFECTION IN URINARY DISEASE.

BY HERBERT T. HERRING, M.B., B.S.,
London.

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SOME RESULTS OF MICROBIC INFECTION IN URINARY DISEASE.

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In the treatment of urinary affections strict aseptic precautions are so important as to call for far more attention from the profession than they have hitherto received. If they were efficiently carried out, many of the most distressing urinary symptoms, and consequently many operations now rendered necessary by a septic condition, would undoubtedly be avoided. The writer, therefore, proposes to point out some of the more marked symptoms produced by their neglect. At the present time the greater proportion of urinary diseases are at some time associated with, if not actually caused by, an inflammatory condition of the organs. This inflammation—excluding those forms arising from the administration of toxic drugs, the wounds of aseptic instruments, and the introduction of chemical irritants—is due to the presence of some micro-organism, often introduced into the bladder from without, and frequently by septic instruments used for the purpose of treatment or of examination. Infection thus occurring in an otherwise healthy bladder generally causes an attack of acute cystitis, from which the patient recovers in a short time, the severity depending on the "dosage." If, however, the patient is already the subject of some urinary disease, as retention of urine, calculus, tumor, or stricture, the affection takes the chronic form, producing special complications and symptoms, in addition to those already existing, which may now be considered more in detail.

Chronic cases of retention as the result of paralysis or of obstruction to the outflow of urine are frequently met with. The bladder may be greatly distended, as is evident from abdominal examination, and the characteristic symptom of great frequency of micturition, especially at night, is well marked. But the urine, notwithstanding the evident chronic retention in the bladder, is

acid, clear or nearly so (in some cases it is slightly cloudy, from an excess of mucus and bladder epithelium), and contains no pus. In fact, it is sterile. After infection the desire to micturate is intensified, and the bladder in the endeavor to expel its contents is thrown into painful and prolonged spasms, which recur at short intervals. Hæmaturia is often noted, especially if the residual urine has been too rapidly withdrawn. The urine itself is alkaline in reaction, thick and offensive, and contains much ropy muco-pus, vesical epithelium, blood-clots, and various crystals of urinary decomposition, and teems with micro-organisms. Rigors and high temperature, due to the absorption of products of bacterial action on both tissue and urine, occur, associated with grave constitutional symptoms. The more remote consequences are exfoliation of the epithelium, causing superficial or deep ulceration; abscess, if the deeper layers are affected without this process; chronic engorgement of the vessels of the mucous membrane near the neck of the bladder; formation of phosphatic calculi, from the condition of the urine; and, lastly, extension of the inflammatory process along the ureters to the kidneys, more common when these canals have been dilated by long-standing backward pressure. The treatment of septic chronic retention should comprise (1) gradual withdrawal of the residual urine, so that irregular contractions of the bladder, causing folds and pockets, may be avoided. All instruments should be passed with strict aseptic precautions, even if the urine is already septic; otherwise fresh inoculations may take place, with prolongation of the acute stage. (2) The power and healthy condition of the bladder must be restored as far as possible. (3) When the organ has been emptied, the fresh supplies of urine are to be removed frequently, before they have time to undergo decomposition. Under this treatment the patient recovers gradually from the acute symptoms, often apparently entirely; but a careful examination of the urine will usually reveal the presence of pus and micro-organisms, and while these exist fresh attacks of a similar nature are liable to occur. All that can be said about cure in these septic conditions of the bladder is that it may be accomplished if the original disease be entirely relieved or removed, and of them all septic chronic retention holds out the least promise of complete recovery.

In stone the writer refers to those forms of calculi which originate in the kidneys as "sand" or "gravel,"—composed most com-

monly of uric acid,—and, descending into the bladder, lodge there, probably because the organ is unable to empty itself completely. The symptoms are increased frequency of micturition, more noticeable by day and on taking exercise, pain at the end of the penis after voiding urine and on movement, and hemorrhage caused by any exertion. When there is no bleeding, the urine is acid, and slightly cloudy perhaps from an excess of mucus and bladder epithelium. The stone itself is composed of concentric layers of uric acid. Contrast these symptoms with those which arise as soon as the case becomes septic. The frequency of micturition is more pronounced, troubling the patient both day and night and whether he is at rest or moving, pain and discomfort are constantly present, and the bleeding is more persistent and easily provoked. The urine is frequently neutral or alkaline, and thick from pus and mucus. The calculus is now coated with a layer of phosphates, often quickly deposited, with considerable increase of the stone. The treatment is, of course, the removal of the stone, with the hope that the urine will then regain its normal condition; but the fact that "residual urine" is so often present in the bladder prevents a favorable prognosis.

The characteristic symptom of papilloma of the bladder is intermittent and painless hæmaturia, increasing in severity and frequency as the tumor advances. The urine, when free from blood, is clear. Septic inflammation, even in the early stages of the disease, causes pain, increased frequency of micturition, and prolonged attacks of hemorrhage, quite out of proportion to the size of the growth. The urine is alkaline, thick, and offensive. The after-effects are ulceration and deposit of phosphates on or about the tumor, which increase the distress of the patient very much. The treatment is either the removal of the tumor entirely by operation—in any case the phosphatic deposit should be thus dealt with —or the daily application of weak solutions of nitrate of silver to the part, continued for many months, as suggested by Sir Henry Thompson, or a combination of both methods. The injections are employed to improve the septic condition of the urine and bladder, to check the hemorrhage, and to control the growth. Whatever treatment is adopted, and the writer has found the latter method most efficacious, it is exceedingly difficult to render the bladder and growth free from micro-organisms when once infected. With

regard to malignant tumors all that need be said is that the symptoms are exaggerated and the fatal termination of all such cases is accelerated.

A patient suffering from stricture, whether arising from injury or gonorrhœa, is conscious only—provided septic inflammation has ceased—of a gradual diminution of stream, accompanied by some perineal discomfort and perhaps increased frequency of micturition. Shortly after the introduction of a dirty bougie, the mucous membrane at or near the seat of stricture becomes inflamed and congested, this site being especially prone to attack, no doubt, on account of the injury and abrasion caused by the instrument. The stream is consequently decreased, and, should the stricture be at all narrow, retention results. Stoppage of urine from reaction —that is, inflammation set up by aseptic causes—is also sometimes produced by too severe instrumentation and dilation, but both causes are often associated. Pain also of a scalding character is complained of, and discharge appears at the end of the penis or may perhaps be easily seen as shreds—composed of mucus and pus —in the first portion of the urine voided. The remote consequences of septic infection of stricture are the formation of perineal abscesses and fistulæ, ulcerations in the neighborhood of the stricture, hemorrhage, and the extension of the inflammation to the bladder, and consequent chronic cystitis, with the possible formation of calculus. Among the most troublesome strictures to deal with are those subjected to severe and frequent instrumentation undertaken without any aseptic precautions whatever, as is evident from the rigors and fever which follow the operation. The treatment is the careful and gentle dilatation of the stricture, associated with suitable applications to the mucous membrane of the urethra and bladder. The prognosis, when the stricture can be freely dilated, is perhaps the most favorable of all cases of infected chronic bladder diseases.

To sum up, therefore: the introduction of micro-organisms gives rise in a healthy bladder to an attack of acute infective cystitis, and in one already subject to abnormal conditions to a chronic form, liable to exacerbations and very difficult to cure. Associated with this chronic condition are, first, constitutional disturbances (rigors, fever, etc.) due to bacterial intoxication, and not caused by the use of the catheter, as was formerly stated (hence termed "catheter fever"); and, secondly, special local complications in

addition to the characteristic symptoms of the particular disease in question. Formerly patients may have escaped cystitis although treated with septic instruments, owing in a great measure to the skill of the manipulator in avoiding injury and abrasions to the tissues. It is still most important that gentleness and care should be exercised in the treatment of urinary troubles, not to prevent infection, which should be impossible, but to avoid traumatic inflammation. Moreover, the writer would call special attention to those chronic forms of urinary infection in which the constitutional symptoms are predominant. He is convinced that many obscure symptoms associated with the nervous, the digestive, the respiratory, or the cardiac organs are often due to a septic condition of the tissues and the urine. Such symptoms would be easily accounted for if more care were taken in eliciting facts relative to urinary disorders and in the bacteriological examination of the excretion.