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TREATMENT OF TUBERCULOSIS OF THE URINARY TRACT*

BY

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Urinary tuberculosis is a focal manifestation of a general disease, and thus treatment must be both general and local. In sanatorium patients suffering from phthisis or bone and joint tuberculosis a symptomless bacilluria is not uncommon: it necessitates a complete urological investigation, but in many cases no lesion can be demonstrated. Medlar (1926) and Band (1942), after prolonged study of this subclinical form of urinary tuberculosis, found that both kidneys contained microscopic tuberculous foci and that such foci often healed. It is thus a cardinal rule that there is no place for surgery unless a lesion can be demonstrated by pyelography or by x-ray or cystoscopic examination.

It hardly seems necessary to say that the most common initial symptom of urinary tuberculosis is increased frequency of micturition. This symptom, associated with pyuria and an absence of pyogenic organisms, should be regarded as probably of tuberculous origin, apart from that uncommon disease abacterial pyuria. Demonstration of the tubercle bacillus is necessary, and if this is not possible on the examination of a single specimen of urine the search should be continued from several 24-hour specimens. Culture and guinea-pig inoculation must also prove negative before this infection can be excluded. A symptomless pyuria found by chance, as during a life assurance examination, is not uncommonly due to renal tuberculosis where the lesion is shut off intermittently by calcification in the ureter. The following case illustrates this.

A man aged 31, enjoying perfect health and employed as a tea planter in India, decided to take out a policy of life assurance. At the examination slight pyuria was discovered and tubercle bacilli were found. He returned to this country for nephro-ureterectomy, as pyelography had demonstrated a functionless right kidney and a normal left kidney. On arrival here repeated examination of 24-hour specimens of urine, culture, and guinea-pig inoculation was negative: the urine was normal and there was no pus or blood cells. Cystoscopy showed an indrawing of the right ureter mouth, into which a catheter could be inserted only for a distance of 0.5 cm., but an otherwise normal bladder. X-ray examination showed a few calcified areas in the kidney and considerable calcification in the ureter below the right sacro-iliac joint. Otherwise the findings of the Indian surgeon were confirmed. Nephro-ureterectomy was performed and

the kidney found to be grossly affected by caseo-cavernous lesions, and tubercles were visible throughout the cortex.

This case illustrates the importance of repeated urine examination when pyuria is present and, in certain cases, the element of luck in diagnosis when the pyuria is intermittent.

As I have previously stated, urinary tuberculosis is a focal manifestation of a generalized infection—it is always secondary to another lesion elsewhere which may be latent. Investigation and treatment thus must be both general and local.

General Treatment

General treatment demands a sanatorium régime, which may include treatment by streptomycin and *para*-aminosalicylic acid (P.A.S.); but whether this general treatment is carried out in a sanatorium or not must be left to the discretion of the medical attendant. The effect of streptomycin and P.A.S. on urinary tuberculosis has been investigated on behalf of the Medical Research Council by Jacobs and Borthwick (1950) and Jacobs (1951), and they seem to have proved that no known chemotherapeutic agents or antibiotics, alone or in combination, can be depended upon to cure or control an established renal focus. These substances must therefore be regarded as an adjunct to other forms of treatment, and meantime the best therapy is prolonged sanatorium care and the extirpation by surgery, where possible, of any demonstrable focus. Jacobs (1952) states that from chemotherapy the following benefits may be expected: (1) *A tubercle-positive urine can be rendered tubercle-negative*, but in the presence of a renal focus of more than microscopic dimensions this change is likely to be transient. (2) *Mild secondary cystitis and superficial bladder ulceration generally respond to the treatment with a corresponding improvement in the symptoms*. These benefits are chiefly observed in those suffering from clinical unilateral renal lesions on whom nephrectomy has been performed. (3) *As an "umbrella" for nephrectomy, partial nephrectomy, or epididymectomy* streptomycin is probably a safeguard in preventing haematogenous dissemination and sinus formation.

Treatment by these and other antibiotics, and by chemotherapeutic agents such as the thiosemicarbazone

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drugs (Cosbie Ross, 1951) and isonicotinic acid hydrazide (*British Medical Journal*, 1952; *Lancet*, 1952), is being evolved rapidly, but meantime it consists as a rule in the administration of streptomycin in doses of 0.5 g. morning and night to a total dose of 40 g. P.A.S. is also recommended to be given simultaneously, as it appears to increase the effect of the streptomycin and lessen the chance of the bacilli becoming resistant. For an adult 20 g. daily is given in divided doses four times a day over a period of six months or longer, the duration of the treatment being influenced by the response.

Because of the increased tendency to cicatrization associated with streptomycin therapy, sequelae of a character which worsens the condition of the patient may result. It therefore is not permissible to give the treatment indiscriminately with the idea that should no benefit be obtained no harm will result. According to Jacobs (1952), the drug should be withheld in the following circumstances: (1) *Urinary tuberculosis associated with advanced bilateral renal lesions or an advanced lesion in a solitary kidney*: no benefit can be expected from the treatment, and the risk of toxic symptoms is therefore not worth taking. (2) *A severe constriction at the uretero-vesical junction or a well-marked stricture of the ureter, particularly when associated with a single kidney*: the increased cicatrization resulting from streptomycin may be followed by hydro-ureter and hydronephrosis. (3) *Severe secondary cystitis associated with marked bladder contracture*: the contracture already present may be worsened as a result of the increasing cicatrization caused by streptomycin.

Surgical Treatment

If surgery is decided upon, the operation should be performed when the peak of general condition and power of resistance is attained. The timing of that peak should be determined by an experienced tuberculosis physician. In a patient suffering from renal tuberculosis whose general condition is satisfactory the minimal period of preparation for operation should be two weeks, during which he should have treatment with streptomycin and P.A.S. while resting in bed.

Operative treatment will naturally depend on the site and extent of the lesion. The treatment which has been found most suitable for the various types of lesion is as follows:

1. *Where there is any demonstrable renal lesion with or without cystitis* nephrectomy is indicated. On exposing the kidney at operation the upper ureter should be palpated, and where disease, denoted by enlargement and thickening, is found that ureter in its whole length should be removed with the kidney. Thus the operation in these cases is not nephrectomy but a nephro-ureterectomy. A common complication following nephrectomy alone for renal tuberculosis is the formation of a chronic sinus. This is unknown in my unit, where for over 20 years the practice has been nephro-ureterectomy *en bloc* except where the ureter appears normal: in such cases we are content with the removal of the upper 4 in. (10 cm.). A short description of the technique might be of interest.

The kidney is exposed through an oblique incision in the loin, and by gentle finger or scissor dissection it is freed and, if possible, partially exteriorized. The vascular pedicle is then carefully exposed by dissection, double clamped, divided, and trebly ligated. The ureter is examined, and if it shows the least abnormality it is freed down to the level of the iliac vessels. The incision is now closed except for

the small opening through which the ureter issues with its attached kidney hanging free. The patient is rolled on to his back and a vertical incision made in the midline. The peritoneum is exposed and retracted inwards and the ureter easily identified by gentle traction on the kidney; it is dissected and freed to the bladder wall, at which point it is divided between clamps by a scalpel the blade of which has been dipped in pure carbolic acid solution. Both ends of the divided ureter are then separately treated by carbolic acid followed by spirit, doubly ligated, and the clamps removed. The end of the ureter attached to the kidney is inserted into a sterile finger-stall, which is then tied over it, and, following on that, the kidney is pulled on and removed complete with its ureter. Both wounds are now completely closed without drainage, and healing is by first intention. The extra time required to remove the ureter with the kidney is about ten minutes, and the resulting added strain on the patient is negligible. By this radical operation continual seepage of tubercle bacilli into the bladder is obviated and ulceration prevented, or, if already present, given a better chance to heal.

2. *Where the lesion found on pyelography is a small ulcero-cavernous lesion affecting a polar calyx of one kidney* the treatment of choice is partial nephrectomy. The indications for this operation are uncommon, and I have found only one case in which I thought it justifiable; the result after two years is satisfactory and the urine remains tubercle-negative. The method undoubtedly has a place, but the selection of the case requires experience and judgment, and the operation calls for great technical ability. In an unsuitable case it is a hazardous procedure, with the possibility of a later and difficult nephrectomy performed on a patient in poor condition.

3. *Where both kidneys show demonstrable renal lesions* operation, generally speaking, is contraindicated. Treatment in a sanatorium combined with streptomycin and P.A.S. offers the best chance. The progress of the disease should be checked at intervals by pyelography. If one kidney is grossly diseased and the other shows only a minor lesion nephrectomy or nephro-ureterectomy of the severely affected organ may prevent spread of the disease in the less-affected kidney and in the bladder. If the lesion in the better kidney is minimal and stationary a partial nephrectomy should be considered at an interval after removal of the worse kidney.

4. *Where one kidney has already been removed and the remaining kidney is affected* the possibility of operative extirpation of the disease will depend on whether the focus is confined to one pole of the kidney. In a few cases partial nephrectomy may be possible.

5. *When the patient has an active lung lesion in addition to a renal lesion* the operative treatment of the renal lesion must await control of the more serious lesion before surgery is attempted. The lung lesion spreads more rapidly and is a greater danger to life than the renal lesion, and thus in these cases the surgeon must be guided by the tuberculosis physician.

Tuberculous Cystitis

The treatment of tuberculous cystitis, apart from the extirpation of gross foci in the kidney and ureter, actually depends on the size and depth of the bladder lesion. In most cases removal of the affected kidney and ureter leads to healing of the bladder and relief from symptoms. This process is gradual and may take several months. It can be accelerated by a sanatorium regime. Where the tuberculous ulceration is superficial the administration of streptomycin and P.A.S. encourages more rapid healing. When the ulceration is deep, however, interstitial changes develop in the bladder wall; these drugs should then be withheld owing to the increased fibrous contracture they are likely to cause. Where this interstitial fibrosis has in fact occurred the change is irreversible, and the bladder, incapable of distension, can contain at most only a very small quantity of

urine. Frequency becomes acute and may ultimately reach virtual incontinence. The ureters are affected by back pressure arising from the contracted bladder or fibrosis and stricture of their lower ends, and hydronephrosis and hydro-nephrosis result. Renal impairment becomes progressive, with ultimate death from uraemia.

The only way to save a patient so affected is to divert the urinary stream from the bladder to the colon or skin, and this should be done before hydronephrosis is established. Bilateral renal involvement with tuberculosis or the presence of a solitary diseased kidney is not necessarily a contra-indication. The urinary diversion may not save life, but it will certainly prolong it and ensure some measure of comfort. Transplantation of the ureter or ureters into the colon is now a well-tried procedure and gives the minimum of discomfort and after-trouble, but in a very occasional case it may be preferable to bring the end of the ureter to the skin surface. The difficulty here is the collection of the exuding urine without leakage with all its discomforts. In such a case the formation of a skin-covered spout, or nipple ureterostomy as described by Band (1950), makes leakage unlikely and may add greatly to the patient's comfort and well-being.

Epididymectomy

Tuberculosis affecting the epididymides, the seminal vesicles, and the prostate can result from a direct blood spread, but often it follows infection of the prostate direct from the prostatic urethra. Although this paper concerns urinary tuberculosis, it must be remembered that at least 50% of cases of genital tuberculosis result from a renal source by direct spread through the ureter, bladder, posterior urethra, prostate, and seminal vesicles to the epididymides. Hence it follows that in any case of chronic epididymitis a complete investigation of the urinary tract is necessary. When a focus is found in the kidney, nephrectomy, and possibly ureterectomy, followed by sanatorium treatment, may be enough to arrest the disease, but in some cases epididymectomy will be required in addition.

Conclusion

Might I summarize by again repeating that tuberculosis of the urinary tract is a focal manifestation of a generalized infection, and thus investigation and treatment must not be confined to one system. The principles of treatment are by rest in suitable environment, adequate nutrition, and the aiding of the body's defences by suitable antibiotics and chemotherapeutic measures. When the local lesion is demonstrable general measures are never enough and surgical extirpation is essential, but it must be undertaken only when the patient has reached the optimum condition likely to be achieved by a sanatorium régime, and it must be followed by the prolonged rest and treatment required to ensure against recurrence of active disease. Finally, it cannot too often be reiterated that surgery alone is not enough; it can only be regarded as one of the weapons in the attack on this major killing disease.

I desire to express my thanks to my friends and colleagues, Mr. D. Band, Mr. W. M. Borthwick, and Mr. A. Jacobs, who have been pioneers in the modern investigation and treatment of genito-urinary tuberculosis, for their willing help and permission to quote from their experience.

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CLINICAL PSYCHOLOGY AND SOME FORGOTTEN EPISODES*

BY

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We can all talk about psychology now, though when I qualified 50 years ago one rarely heard the word. Since then I have been carried along on a stream of events related to clinical psychology and with a curious repetitive pattern. These I propose to recapitulate, with the intention of drawing a moral from them.

The Hysterical Symptom in Wartime

The stream caught me when in November, 1914, I joined the R.A.M.C. and became the surgical member of a board in London for sick and wounded officers. At that time the war neuroses had not been recognized and shell-shock was not yet invented. Many of the officers we boarded suffered from functional troubles, chiefly hysteria, and brought to us diagnoses of physical disorders that for me did not exist. I was taken aback, for I could not believe I was a better diagnostician than the élite of Harley Street. I am less diffident now, but I did not realize then that to make a correct diagnosis—in one case or many—would set up the insoluble problem of what to do next. Nobody likes insoluble problems, and my attempts to draw official notice to what was happening did not meet with encouragement. In the new year I was transferred to the Alexandra Hospital, near Portsmouth, as a surgical specialist, but before that, having seen how frost-bite (later called trench-foot) was carrying a heavy load of hysteria, I joined my old colleague E. G. Fearnside in examining a batch of men in hospital with that diagnosis, and we published a paper in 1915 declaring that many of them showed hysterical symptoms. So far as I know this was the first mention of war neuroses in our literature.

At the Alexandra Hospital, if I made the diagnosis of hysteria I had to face for myself the problem of what to do next. Thus when I insisted that a man in my ward, supposed to have tuberculous disease of the tarsus, really presented a hysterical clubfoot, for which I could do nothing, I was assured that the War Office would not accept the diagnosis of hysteria as an invaliding disability and I must board him out as a sufferer from tuberculous disease. I cannot detail the manoeuvres that led to his being invalided out with the correct diagnosis, but within a few weeks he had re-enlisted and his new M.O. wrote to us asking what had been his disability. Soon after this, when a similar case appeared before an invaliding board as talipes varus following osteoarthritis, and I demurred at putting my name to that diagnosis, the man was sent to my ward to be dealt with as best I could. After a time the M.O.s of neighbouring units sent their tricky cases "for surgical opinion and advice." I found myself carrying on an out-patient clinic and sometimes obtained satisfactory results by common-sense methods—methods made up of persuasion and exhortation aided

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