Edinburgh Medical Journal

March 1924

SOME ASPECTS OF THE DIAGNOSIS OF RENAL TUBERCULOSIS.*

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RENAL tuberculosis manifests itself in so many ways according to the stage of its development, that its study is difficult and intensely interesting. It is only since the introduction of X-rays and the cystoscope that the importance of this condition has been fully recognised, and it is the use of the cystoscope that is so important. My own experience agrees with that of others, in that cases are seen at a very late stage; this, in my opinion, must not always be a charge against the profession. The onset of the condition is frequently so gradual and causes so little discomfort, that patients do not realise they suffer from any disability. It requires the onset of continuous pain, hæmaturia, discomforting or annoying frequency of micturition to cause the patient to seek relief. The same remark applies equally well to many other serious conditions in medicine, *e.g.* carcinoma mammæ, ventriculi, uteri, etc. The body can "put up with" much provided it gets time to accommodate itself. The presence of a sound second kidney, sufficient in itself to carry on life, prevents any apparent deterioration in spite of complete destruction of one kidney.

Many patients with extensive unilateral disease look the picture of health. As I have said, it usually requires the onset of some disturbing or uncomfortable symptom to make a patient seek relief.

Another factor which tends to the late recognition of the disease is the tendency to treat symptoms, viz., cystitis or pain, and even hæmaturia, and only when prolonged treatment

* Read before the Tuberculosis Society of Scotland in Aberdeen, 27th October 1922.

with palliatives fails to give relief is an expert called upon to make a diagnosis. Any practitioner ought to be able to make a diagnosis of urinary tuberculosis quite early in the course of the disease in typical cases; the expert is necessary only to decide the site of the disease and whether one or both kidneys is involved.

To surgeons must be given the credit of elucidating this disease, as it is because of their work and observation that its pathology, diagnosis, and treatment have been placed on anything like a sure foundation. Tuberculosis is the most frequent renal disease requiring excision of the kidney. Thirty per cent. of all surgical lesions of the kidney are tuberculous.

The view that chronic tuberculosis of the kidney begins usually as a unilateral affection is quite a recent one, and it is now accepted that the disease is secondary to some other, often inactive and insignificant focus. Pathologists were slow to recognise this fact, as they were more accustomed to see the end results of the disease only, but this view has been practically demonstrated often enough to convince the greatest sceptic.

Knowing this—that renal tuberculosis in the great majority of cases commences in one kidney, and knowing also the hopeless position of a patient in the late stages, it behoves us to use every endeavour to diagnose the condition in its earliest stage. In any series of cases reported, it is quite common to find that a period of anything up to twelve months has elapsed from the onset of the symptoms until a definite diagnosis is made. To my mind this is due not so much to the difficulty of diagnosis as to want of knowledge of the disease and its early symptoms. Quite recently I had under my charge a case of advanced renal tuberculosis, whose first symptoms was hæmaturia two years before, and who was treated symptomatically without any definite diagnosis being made.

It is held by most authorities now that through surgery lies the only hope for a cure in renal tuberculosis, medical treatment may palliate and temporarily relieve symptoms, but ought not to be relied upon for curative purposes. "There has never been in the history of medical literature a single authentic case of spontaneous healing of a tuberculous kidney. The ultimate outcome is always one of

complete destruction of the kidney, and usually severe mutilation to the rest of the urinary tract."

Another important indication for its early recognition is the fact that it is a disease of early adult life, about 70 per cent. of cases occur between the ages of 20 and 40. The disease may occur in children, but then it is usually associated with a more widespread tuberculosis, and is not amenable to surgical treatment.

Recent clinical experience and post-mortem reports tend to show that males are more affected than females. Formerly the view was held that the disease occurred twice as often in females as in males, but this idea was due to the fact that females were much more easily examined.

There has been considerable discussion as to the mode of infection of the kidney, but the generally accepted opinion now is that the disease is hæmatogenous in origin in the majority of cases, *i.e.*, the kidney is infected through the blood stream. The old idea that the kidney was infected from the bladder along the ureter has been entirely given up; this idea was founded on the fact that the bladder symptoms were usually the primary ones, and the bladder was looked upon as the original focus. Ascending infection up the unobstructed ureter does not occur (Geo. Walker).

With a tuberculous lesion anywhere in the body, it is reasonable to suppose that frequent temporary bacillæmias may occur, and it has been shown that tubercle bacilli can be excreted through healthy kidneys. Very little lowering of the resistance in the kidney would render it liable to become itself infected. The original lesion in the kidney is held by many to take place about the base of the pyramids; this is explained by the fact that here the vascular arrangement is terminal, the tubules are broader, and the epithelial cells are supposed to possess phagocytic power. Anyhow, numerous cases have been reported where the lesion is a circumscribed one in the body of the kidney. From this site, the disease may gradually spread outwards to the cortex and inwards to the pelvis. It is when the latter occurs that we get the typical symptoms. Infection through the lymphatics is a theory still held by many observers, and examination of certain cases seems to bear this out. Demonstrations have been offered of the extension of tuberculosis from the apex of a lung through glands along the aorta, through the diaphragm

to the kidney (Bromgersma). This mode of infection, *i.e.*, lymphatic, probably explains those cases where the disease is found to affect the peri-renal structures or the pelvis without any demonstrable lesion in the kidney. These cases, however, are few.

However the infection occurs, there is no doubt that the disease is progressive, the rapidity of progress depending upon the patient's resistance, and such conditions as hydronephrosis, pyonephrosis, perinephric abscess, ureteritis with stricture, cystitis, etc., assuredly follow. The acuteness of these sequelæ depends greatly upon whether or not the original lesion becomes secondarily infected, *e.g.* with *B. coli*, and to this I may refer here, namely, many cases undergo prolonged treatment as bacilluria (*B. coli*) with vaccines, etc., ignoring what may be the primary condition. *B. coli* are much more easily found, and vaccine therapy is fashionable. Several of my own cases had undergone treatment with urotropine and vaccines for weeks before the underlying cause had been demonstrated. In all cases of *coli bacilluria* it is advisable to make a complete examination for a primary condition. From a knowledge of the pathology of the condition it is easy to see how the symptoms from which a diagnosis has to be made may vary greatly. The symptoms depend upon the position and extent of the lesion, the resistance of the patient to the disease, etc.

I should say that the earliest symptom of any was *frequent micturition* due to two causes—both owing to a local irritation of the kidney: (1) an increase in the amount of urine, and (2) an increased sensibility of the bladder. Both of these conditions could occur from any location of the disease, be it perinephric or in the body of the kidney.

Now frequency of micturition has a great many causes—exposure to cold, intake of an excessive amount of fluid, certain renal irritating diets, nervous conditions, etc., and far too frequently one is apt to think too little of this initial symptom. The frequency may be intermittent, and this further tends to its being ignored; it may also be at times excessive and accompanied by some want of control; this appears most frequently in young people, and many of the cases have undergone prolonged treatment for enuresis. Unless there is a very evident temporary cause for frequency a complete urinary examination should be made. Practically all the cases that have come under my notice have given frequency as one of their earliest symptoms.

Pain during or after micturition is also a very early symptom in a fair proportion of cases. Unfortunately in my own cases, the history was always a long one, and it was difficult to exclude a local bladder lesion as a cause of the pain. However, the pain does occur without a bladder lesion, and is explained by an "irritating" urine, due probably to toxins, and exemplified by the sudden cessation of painful micturition after nephrectomy even if local bladder lesions still remain. This pain in the early stages is not always of a very severe character, and it is remarkable how long this and the previous symptom of frequency are borne by a patient before seeking relief.

Many authorities lay stress on a premonitory albuminuria. One could understand the presence of albumen with pyuria, hæmaturia, etc., but evidently there are cases of albuminuria due probably to some congestive condition or irritation from a localised parenchymatous focus not extending to the excretory channels. It is thus possible to have a fairly large focus of tuberculous disease in a kidney, the only symptoms being frequency of and painful micturition and perhaps slight albuminuria, any or all of which may escape detection for a considerable time.

As soon, however, as the disease extends to the excretory parts of the organ other symptoms appear, and it is in these cases that we get the typical symptoms which ought to lead to the proper diagnosis. Besides the previously mentioned symptoms we get: (1) pyuria, (2) hæmaturia, and (3) pain in the lumbar region. The amount of pus varies with the extent of the disease and any secondary infection, but in the early stages it appears as a fine delicate cloudiness in the fresh urine. The urine is acid. Hæmaturia, as an early symptom, varies greatly; in the latter stages with ulceration of pelvis and bladder it is common, but a slight admixture of blood and pus is fairly frequent. Severe hæmaturia as the first symptom of the disease, like hæmoptysis in chest conditions, is not quite so common as was at one time supposed, and with care one can frequently elicit a previous history of some urinary discomfort. Pain in the kidney region one would think ought to be a very early symptom, if we consider any congestive or other condition leading to stretching of its capsule, or irritation of the perinephric structures. It is surprising to read in many statistics how often this symptom is absent.

The characteristic symptoms then of renal tuberculosis at

an early stage are: bladder irritation, frequency and some pain, cloudy acid urine, pyuria, perhaps hæmaturia, and perhaps pain in a kidney region.

A falling off in the general condition is a sign not always present, as quite a number of the cases appeared to be in robust health, although, as the disease spreads and toxæmia develops, this falling off in general health becomes marked—loss of flesh, anæmia, a feeling of being easily tired, breathlessness, etc.

An analysis of a series of cases would reveal something like the following proportion. In about 85 per cent. of cases frequency was the initial symptom. Pain in kidney region at the beginning in about 20 per cent. of cases, and during the course of the disease in about 50 per cent. or half the cases. All statistics point to the same long duration of symptoms—histories range from weeks to years—generally averaging over 12 months. In my own cases the duration of symptoms ranged from 3 months to 5 years, or an average of over 18 months. Hæmaturia occurs in about 40 per cent. of cases, and very seldom as the only symptom.

I do not wish to go fuller into the pathology and spread of the disease as this would take much time. But from the original hæmatogenous focus the disease gradually spreads by contiguity or by the lymphatics, through the kidney, and down the urinary passages, involving the ureter and later the bladder, with the usual well-known progressive tuberculous lesions, Sooner or later the other kidney becomes involved, usually through the lymphatics, but occasionally as a fresh hæmatogenous infection.

Simultaneously with the extension of the pathological conditions the symptoms become worse, micturition more frequent and painful, more pus and blood in the urine, accompanied by progressive general signs, loss of appetite, weight, fever, etc.

Diagnosis. — The diagnosis of renal tuberculosis really depends upon the finding of the tubercle bacillus in the urine. It is said that the organisms can be found in 75 to 80 per cent. of all cases. There have been special methods of fixing and staining advised, but about these most of you here know much more than I do. Guinea-pig inoculation is useful and often necessary, but inconvenient because of the time necessary for the test; it is said that about 3 per cent. of the findings of guinea-pig inoculation are negative in positive tuberculosis.

The diagnosis so far could be done by a general practitioner and a pathologist, and it is now that the various means of the expert are called in to diagnose (1) the site of the disease, and (2) the extent of it, *i.e.*, is the condition unilateral or bilateral; and the instrument which has done more than anything else to help us in this is the catheterising cystoscope, aided in some cases by X-rays and pyelography.

As regards treatment, I would venture to advise nephrectomy or nephro-ureterectomy, the immediate mortality from which may be placed at less than 2 per cent. This is for unilateral affections, where the case is bilateral, nephrectomy is not advisable except for an acute unilateral complication. If both kidneys are affected and the worse one removed, the other does not heal.

The ultimate results after nephrectomy have been stated by Bruasch as follows: 80 per cent. recover, 20 per cent. die within five years, 60 per cent. are completely cured.

Of the 20 per cent. who die within five years, the causes of death commonly are: pulmonary tuberculosis, tuberculosis of the other kidney, and miliary tuberculosis, but reliable data are difficult to obtain.

Many authorities advise the use of tuberculin after operation, and certainly strict sanatorium regime is extremely advisable. Surgical results in this disease leave no doubt as to the line of treatment when compared with the results obtained by medical means. These are difficult to obtain, but some time ago Wildbolz, from an analysis of some hundreds of cases, stated that only 20 per cent. live longer than five years.