Remarks

ON

THE MEDICAL ASPECTS OF
HAEMATURIA.*

BY

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THE title of this discussion is rather a misnomer, for it suggests that cases presenting this very common and important symptom can be divided into two classes: medical and surgical. I suggest that the condition of haematuria demonstrates—what I take it we all believe—that, in the first instance at all events, all patients are both potentially medical and surgical: that is to say, they are suffering from pathological conditions, and we do not know at first—sometimes we do not know at last—whether these conditions lie chiefly in the province of the surgeon or of the physician. Several types of haematuria in their causation interest mutually both sides of our work—nephrolithiasis, for example; tuberculosis; urinary tract infection; neoplasm: all of these are conditions which frequently give rise to haematuria, and they all have both medical and surgical bearings.

Still, I think it is clear what is intended by the title, and I do not propose to deal with certain forms of haematuria which are essentially surgical in their aspects. Trauma, of course, is outside my sphere; so also is neoplasm when it is operable; also calculus of the gross kind giving definite indications for nephrotomy or nephrectomy; again, tuberculosis when the primary condition is renal, as it nearly always is, and radical measures can be employed by way of excision, partial or complete. Further, certain anatomical defects in the vessels and in the position of the organ, when these are diagnosed as being the cause of the haematuria, are outside the sphere of the physician. But I would like to stress the point that haematuria is a symptom which in many cases calls for an approach from both the medical and the surgical aspect in investigation, and very also often in treatment.

As regards definition, I take it that the word as we use it has no reference to microscopic amounts of blood or even to specimens of smoky urine, but to the grosser condition in which blood is present to the naked eye as blood, and at some periods in considerable amount.

I thought it might be useful, as giving me certain types of cases to discuss, if I took a list of cases of haematuria of the kind I have just mentioned—gross, frank haemorrhage—in patients, male and female, who have been in my medical wards, during the past five years, and have therefore been under my own observation, some of them jointly with my colleague Dr. Gow. I have had the cases tabulated—fifty-four in all—in which during the last five years haematuria has been observed either as the main symptom or as a very important and striking symptom. The final diagnoses with regard to these patients were as follow: out of the fifty-four cases, twenty were diagnosed as acute nephritis—nearly one-half the cases, therefore, during these five years have been of this nature—seven were cases of chronic nephritis, four of renal calculus, four of infective endocarditis, three of urinary tract infection, two were suffering from mitral stenosis, and presumably therefore had renal infarction, two were cases of purpura, and two were thought to be prostatic in their origin. There was one of each of the following: Addisonian anaemia, an interesting case of polycythaemia (Vaquez's disease), haematuria following on administration of hexamine in the treatment of encephalitis, and haematuria thought to be due to intensive salicylate treatment. There were also five unclassified cases, and of these five cases I think two come into that ill defined group of haematurias which have been called "essential haematuria."

* The opening paper of a discussion in the Urological Section of the Royal Society of Medicine on April 28th, 1927. The remainder of the discussion is printed at page 1006.

Acute Nephritis.

I will briefly comment upon each type of case in which haematuria is a common feature. Acute nephritis is obviously by far the commonest disease in which patients come to the physician with haematuria at the present day. We are still without accurate knowledge, however, as to which sort of infection is most likely to produce a haemorrhagic type of urine. It used to be thought that scarlatinal nephritis was highly haemorrhagic in its character. I do not know that that has been borne out by later experience. Then it has been suggested that pneumococcal infections are highly haemorrhagic. I cannot say from my own experience that I have confirmed that statement—indeed, as I said, I am unable to say from my own experience in which infection—whether with streptococcus or pneumococcus or *Staphylococcus aureus*, or other organism—a bleeding tendency is more likely to be produced; with regard to this point I should like to know the experience of others. Exacerbations in acute nephritis with haematuria are rather a striking feature, and come within the familiar experience of the physician. To what are these exacerbations due? Are they due to re-infection or re-intoxication of the kidney from the presumed focus, or are they due to some changes taking place in the kidney and not necessarily due to haematogenous influences? I used to hope—and I hope still—that upon watching these cases of acute nephritis very carefully, making a re-survey every time these crises occur, we might obtain a guide in tracking down the cause of the nephritis, but I have failed in this. These crises, which, by the way, are generally pyrexial and associated with a little exacerbation of the toxic symptoms—with rather more headache and drowsiness—gradually fade out of the picture, and with patience and persistence in the old-fashioned methods of treatment—namely, rest, with vicarious functioning of the skin and of the bowel—most of the cases get well. But I should like to know whether anyone has some evidence or experience showing what is the exact mechanism of these crises.

Another question which not infrequently arises in cases of acute nephritis is, When should septic tonsils be removed, assuming that they are a feature of the case and the practitioner is led to the conviction that they are associated causatively with the disease? I think we used to wait longer than we are inclined to wait now. I do not wait very long, even in the presence of haematuria. The pathogenesis of the case of acute nephritis in which there is no faucial or other recognized source of infection, or site of focal sepsis, is very disappointing. Again and again one finds these cases admitted to hospital—children, the majority of them—and the past history, the present condition, and a thorough survey of the whole case leave a complete blank as to the nature of the infection. There are all sorts of theories, but none of them are borne out by the bacteriological or other evidence.

Chronic Nephritis.

With regard to chronic nephritis, I do not consider I have anything to add to the accepted views, that there are two conditions in which bleeding may occur. The first is chronic parenchymatous nephritis—that is to say, tubal nephritis with considerable oedema, a tendency to chronic uraemic symptoms and cardio-vascular changes which are not very marked. It seems to take very little in the way of subinfection in a patient subject to latent parenchymatous nephritis to produce haematuria. The second type is the so-called chronic interstitial nephritis, granular kidney, or contracted kidney, with high blood pressures and marked cardio-vascular changes. Patients with this condition are subject from time to time to rather frank and definite bouts of haematuria, and these are not associated with subinfection. These facts are borne out by a study of the cases which have occurred in my wards. The term "renal epistaxis" has been rather diverted from Gull's original meaning to a group of cases called "essential haematuria," to which I shall make reference later. There is no reason why the term "renal epistaxis" should not be applied to a form of kidney bleeding which is not associated with marked vascular changes, but that was not the original meaning of the expression.

Some authorities state that if a chronic nephritis is syphilitic in origin bleeding is more prone to occur. To judge by the positive Wassermann reaction in cases of chronic nephritis, if that can be taken as a guide to cases which are syphilitic, there was, in the four cases of which I have notes, no special tendency to bleeding. Nevertheless, it is sometimes said that syphilitic patients tend to a haemorrhagic type of nephritis if the kidney is affected.

Renal Calculus.

With regard to renal calculus, I wonder sometimes if we ought to diagnose renal calculus in the absence of haematuria, assuming that radiological findings are negative. If they are negative and haematuria has not occurred, I think it is questionable whether pain—even pain that seems to be strikingly like renal colic—should be regarded as the result of calculus. In the four cases in this series that I have had under observation, all showed good evidence, either by radioscopy or by nephrotomy undertaken for the purpose of clearing up the diagnosis; but when I come to the cases that are unclassified it is obvious that some may have been due to calculus. I have here a caution to enter, which one of my cases taught me. I overlooked a large calculus in the kidney for a considerable time in the case of a woman who had a gross coliform infection with symptoms of dysuria and with haematuria. She had no renal pain, her kidney could not be felt, and, as it happened, she was not x-rayed for a considerable time. The trouble was not a new growth, but a kidney which had been for years disorganized by the presence of a large calculus. It is a thing to beware of in a case in which infection is very easily demonstrable, and is such as to give rise to haematuria, that calculus may be present as well as the infection.

Acute Infections of the Urinary Tract.

That brings me to acute infection of the urinary tract—another group of cases common to both physicians and surgeons. In one of these cases there was a high temperature—104° F.—dysuria, and very copious bleeding. I think that in this country we are aware of the frequency, or at all events the definiteness, of haematuria as an early sign—perhaps the first sign—of coliform infection of the urinary tract; but, all the same, I wonder how many such cases are still thought to be tuberculous. If epididymitis occur, and it sometimes does, that tends to turn the thoughts still more in the direction of tuberculosis. In one of these cases there was a papilloma of the bladder in addition to the infection—a very deceptive case. The woman had had chronic cholecystitis for some time before she came under observation at St. Bartholomew's Hospital. She had haematuria and a urinary tract infection that was quite marked; but Mr. Ball demonstrated by cystoscopic examination that in spite of all this there was a definite papillomatous condition of the bladder, in a small area actually involving the right ureter.

Like the case of calculus already mentioned, here is another possible source of haemorrhage to bear in mind in cases of infection. This reminds me that although I have not a case amongst this series, I have in private seen a case, and have been partly responsible for the demonstration after nephrectomy, of papilloma of the renal pelvis; so that one should be on the look out for the double cause of haemorrhage—papilloma in the pelvis of the kidney or in the bladder, plus the coliform or other infection of the urinary tract.

Prostate.

Two of my cases were labelled prostatic. The patients were men aged respectively 64 and 74 years, and the diagnosis was not entirely on my responsibility. A surgical colleague agreed that the probable cause of the haemorrhage was the prostate—not malignant—rather soft in one case, and with an unusually large intravesical projection. One of these patients—the man aged 64—had a systolic pressure of 100 and a diastolic pressure of 90, so that possibly the hyperpiesis may have increased the tendency to bleeding.

Haematuria Associated with Heart Disease.

I come now to a more definitely medical class of case—haematuria in association with heart disease. There are three forms of heart disease illustrated in my group. The first is septic endocarditis. As I said at the beginning, I am not concerned with the discovery of a few red blood corpuscles in the urine. That is very important, as we all know, in the diagnosis of septic endocarditis—a very early symptom and a very constant symptom, and one which calls perhaps for daily microscopical examination of the urine over a period of a week or ten days. The pathological condition underlying it is well known, and has been described by Gaskell and others. I am not, however, referring to that, but to frank haematuria, the result of embolism. Sometimes the haematuria is unusually prolonged, lasting for weeks, because the embolus is a septic embolus and no doubt sets up a septic focus in the kidney. The condition is usually painless. But in one of my cases of infective endocarditis—a girl of 18—the patient suffered great pain. Her pain was so severe that I thought for some time there must be some other feature than septic infarction. She complained bitterly of the pain, and once or twice it was so great as to require narcotics. But when she died in hospital of cerebral embolism there was nothing found *post mortem* to cause this pain except the renal infarction.

The second form of heart disease in which haematuria occurs is mitral stenosis. There again the cause is renal infarction. In addition to septic endocarditis and mitral stenosis, there is dilated heart. Patients with chronic cardiac dilatation and chronic renal congestion sometimes have quite a large amount of blood in the urine.

Haematuria Associated with Blood Disorders.

I now come to certain blood states. In this series were two cases of purpura, both of them of Henoch's type. They were children, one of whom is still under observation in the hospital, and has been for a considerable time—three months—and is still bleeding. He is a small boy aged 14, whose illness began ten days before he came to hospital, a few days after eating skate. He vomited and had a rash; a very diffuse petechial eruption was present over the arms and legs, with a few spots on the abdomen; he was very listless. On admission his abdomen was retracted, tender, and he had a little pyrexia. At this time there was no blood in his urine, though a little albumin. He gave a history of having had severe abdominal pain on two occasions preceding this, but there was no history of bleeding. He was put on salicylates when admitted on December 27th, 1926. On January 17th, 1927, for the first time, there was a considerable amount of blood in the urine. On the strength of what one knew to be a fact—namely, that salicylates occasionally produce haematuria, the salicylates were stopped, but the haematuria persisted. He also developed oedema of the hands and forearms. The relation of purpura to haematuria is very complex. The kidney may bleed as an expression of the purpuric state; the toxic element causing the purpura may cause the kidney to bleed. But haemorrhages into the kidney themselves cause renal changes very closely allied to, if not identical with, nephritis, so that it is sometimes very difficult to say what is the sequence of events. This boy had large tonsils which it was thought were septic. In another case of Henoch's purpura the patient had three attacks of haematuria with abdominal pain, and then the condition seemed to clear up.

The case of polycythaemia (Vaquez's disease) which occurred in this series was very interesting. It was that of a woman who had been under observation several times in St. Bartholomew's Hospital and in private—a very typical case of the disease. She had had retinal haemorrhages. She also had an arterial block, I thought, in the artery to the left big toe, where there was commencing gangrene which necessitated amputation. Three months after this amputation of the left big toe she was sea-bathing at Eastbourne, and this was followed twelve hours afterwards by an attack of haematuria which persisted for six weeks, indeed up to the time of her death. It was a very intractable haematuria. The loss of blood was so considerable

as to reduce what had been a polycythaemia to figures which were just above those of a normal blood count. Four years before this event Dr. George Graham helped me in giving her continuous inhalations of oxygen. We demonstrated that the blood state of these patients is not improved by this measure.

Haematuria due to Hexamine.

In this series there is only one case of hexamine haematuria. I think there was no doubt about the causation. It was a case of acute encephalitis. A *post-mortem* examination was made eventually. The patient had been given only a moderate dose—20 grains every six hours—and at the end of the third day there was a profuse haematuria.

Unclassified Cases.

There were five unclassified cases, and I have already said that I feel sure that one or perhaps two of them would be put down as "essential haematuria" by those who consider that there is a group of cases to which we might give that provisional label.

One of these unclassified cases was a patient with aneurysm of the thoracic aorta; she had a profuse haematuria four days before death. The second of the unclassified cases might possibly be regarded as a case of calculus or nephrolithiasis. Then there was the case of a boy of 18 whom Mr. Ogier Ward sent to me from St. Peter's. I failed to make a diagnosis, but Mr. Ball was able to say that the blood came from one kidney only, and not from both. We know that in some of these cases of haematuria without obvious cause it is one side only that bleeds. That is no guarantee, however, that if nephrectomy is performed on that kidney the other one may not start a similar condition.

But perhaps the most typical case of what is termed "essential haematuria" was that of a man of 33 (looking up the literature I find that the cases coming into this loose group of haematurias are generally between 20 and 40 years of age), a cycle maker, who, in 1921, passed blood in his urine. He was examined with the cystoscope without anything abnormal being found. In November of that year he had a certain dull, not acute, pain, but nothing was done, because again nothing further was found. In January, 1922, he had a short attack of haematuria with no other symptoms. When he presented himself at the hospital a third time the left kidney was explored, but again with negative findings. He bled a little in February, 1922, and then nothing happened until he came under observation at St. Bartholomew's Hospital in March, 1923. There was no event in his past history or present condition to suggest any reason for this tendency to bleed. Radiology was quite negative, he had no dysuria, there were no signs of arterial changes, no hyperpiesis, no albumin or mucus in his urine. Conveniently for our purpose, he had an attack of haematuria while thus under observation, but the examination of the urine showed merely that there was a good deal of blood, a few blood casts, but no other casts, and the condition cleared up rather quickly; within a week his urine was normal again. I do not know what has happened to him since, but that is what I regard as a type of case which goes by the name of "essential haematuria."

It is easy to say that this is only a group of cases in which we do not know the cause of the haematuria, but it is a striking fact that in some patients bleeding from the kidneys occurs somewhat easily and without obvious cause. The matter has been written about a good deal, not much in this country, although Hale-White¹ has published a paper on it.

I have seen one case of this type in private. The bleeding was so profuse that everybody was alarmed, and said that something must be done; but everything had been done except nephrectomy, and eventually that was done. I failed completely to find anything wrong with the excised kidney, and I was particularly keen on one or two points which had been brought to my attention: one was the study of the pelvis in view of the possibility of minute papillomata, and the other was the so-called naevoid condition in the kidney substance itself.

Hale-White says of these cases that there is no satisfactory explanation; he uses the term "renal epistaxis" for them, and comes to the conclusion that there are two factors, one an undue ease of bleeding from the kidney and the other some toxic state at present unknown.

In my list there does not happen to be an instance, curiously enough, of tuberculosis, or of drugs other than hexamine. The condition has been brought on by use of carbolic ointments and lotions, and there is our familiar friend rhubarb, to which some patients are susceptible. I have also no instance of bilharzia haematuria. I thought, however, it might be useful to take actual cases as a basis for these rather discursive remarks.

An Address

ON

OBSERVATION, CO-ORDINATION OF KNOWLEDGE, AND JUDGEMENT.

ILLUSTRATED BY THE CARDIO-ARTERIAL SYSTEM.*

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WHEN the subject of the address you invited me to give had been settled, I decided, after consideration, that the cardio-arterial system would afford all the illustration my theme required. I was strengthened in this decision by some sentences in one of the Gifford Lectures, which Professor J. S. Haldane of Oxford is delivering at Glasgow University. He is reported as saying, "From its beginnings the mechanistic theory of life was embarked on a hopeless task." "What physiology was progressively revealing was the detail of co-ordinated physiological activity." These quotations are applicable to the system we are to consider. Last century we heard much about the heart as a pump, and the arteries as pipes. I propose to look at them as the co-ordinated system of a *living pump and live tubes*, which alter their lumen under a variety of influences, and thereby affect the flow of blood through them.

CO-ORDINATION OF HEART AND ARTERIES.

Beginning with the heart, I ask your attention to the case of a lady who came to Edinburgh a short time ago to consult me.

CASE I.—*Weak Left Ventricle: Constriction of Arteries.*

The patient was a woman, aged 44, the mother of two or three children; she told me that for years she had had a leak at one of her valves. The pulse was 120, regular, small, and cord-like; the brachial artery was in a similar state. There was pulsation between the left sternal edge and the vertical mammary line; the left border of the heart by percussion was beyond that line; the right border was two inches to the right of the sternal edge; the veins above the right clavicle were greatly distended, and showed a ventricular systolic wave. On auscultation at the apex the first sound was faint and impure. Over the area of pulsation and over the adjoining sternum there was a loud blowing systolic murmur. The pulsation was not "a diffuse apex beat," but was caused by, and the murmur was heard over, the right ventricle. The murmur was therefore tricuspid in origin. The brachial pressure given by the sphygmometer was 130 mm. These observations, co-ordinated with our anatomical and pathological knowledge, showed that the left ventricle was seriously disabled; that the right chambers of the heart and the veins in the neck were distended with blood; that the safety-valve action of the tricuspid had come into play; and that the right ventricle was strong enough to produce a loud murmur as blood was driven back from ventricle to auricle. The pulse rate was 120, the brachial and radial arteries were small and cord-like.

When we have to deal with a weak left ventricle it means that the ventricle does not and cannot empty itself. The contractions may increase in number, but each contraction only projects a fraction of the ventricular blood into the aorta; there is, to use Professor MacWilliam's words, "defective cardiac output." The dogma of the

¹ *Quart. Journ. Med.*, 1910-11, iv, 509.

* An address delivered to the Royal Medical Society of Edinburgh.