Bacteriuria in Infants

A positive culture of bacteria from the urine has many causes. If contamination can be excluded, bacteriuria indicates either the presence of organisms in the urine contained in the bladder or lower renal tract, or the escape of bacteria from micro-abscesses in a pyelonephritic kidney.

Contamination should be suspected when there is a mixed growth of bacteria, when an organism is grown which is a rare pathogen in the renal tract, or when only a few colonies are isolated. Gross contamination may obscure a genuine infection, or recent treatment with an antibiotic may confuse the whole picture. If bacteriuria and pyuria are both present a genuine infection is certain and pyelonephritis should be assumed to be present, but bacteriuria without pyuria should not be disregarded. The use of the mid-stream specimen of urine (American, “clean catch”) and colony counts has done much to standardize results, and most centres regard a count (of the same organism) of more than 10^5 colonies per ml of urine as significant.

Recent work has shown that asymptomatic bacteriuria is common during pregnancy and in girls of school age. If untreated, 25% of pregnant women with bacteriuria develop symptomatic pyelonephritis. Asymptomatic bacteriuria is therefore frequent in the female, probably because of the short urethra, but spontaneous resolution probably occurs in most instances unless there is some factor likely to encourage persisting bacterial growth, which leads to an ascending infection culminating in pyelonephritis. Among such factors are malformations of the renal tract, vesico-ureteric reflex, obstruction, renal calculi, previous renal disease, compression and reduced motility of the ureters in pregnancy, diabetes mellitus, sickle-cell disease, excess ingestion of phenacetin, and repeated or prolonged catheterization.

In infancy and especially in the neonatal period the diagnosis of pyelonephritis is more difficult than in any other age group except perhaps in extreme old age. Routine specimens of urine are usually obtained by the use of an adhesive plastic bag, a method peculiarly liable to produce a contaminated specimen. The alternatives are to wait for spontaneous micturition and obtain a midstream specimen, or to do a suprapubic bladder puncture. In an article at page 207 of the B.M.J. this week Dr. G. D. Abbott draws attention to some of the problems which arose in a study of the incidence and natural history of bacteriuria in 1,500 infants. In this series he recorded only three infants had a significant bacteriuria, using midstream specimens initially and bladder puncture for confirmation. In two of these infants an intravenous pyelogram was normal but both had bilateral vesico-ureteric reflex on micturating cystourethrography. The bacteriuria cleared without treatment in both cases. The third infant, whose renal tract was investigated because of a single umbilical artery, had a normal pyelogram and cystourethrogram, but bacteriuria developed after the cystourethrogram. In this case also the bacteriuria resolved without treatment. In all these instances the
The Hidden Perforating Veins

The veins within the fascial compartment of the lower limbs are principally conduits for carrying blood back to the heart. The superficial limb veins do not contain a very large quantity of blood, and recent work has suggested that of the main functions of flow through these veins is the control of body temperature.

In a normal person standing still the pressure in the superficial veins in the foot is 120 mm. Hg, but it falls to 30 mm. Hg during exercise. This exercise hypotension occurs after each muscle contraction has squeezed the blood out of the deep system towards the heart and the superficial veins have emptied into the deep veins through the perforating veins. The delicate mechanism of blood flow in the superficial veins is totally disrupted if the valves in the veins which connect the superficial and the deep systems become incompetent. The superficial veins then experience periods of extremely high pressure during each calf muscle contraction which is not followed by the normal phase of low pressure. The superficial veins become distended and tortuous, and the obstruction to the venous outflow from the capillaries eventually causes oedema, pigmentation, ulceration, and aching pains, the clinical features of venous stasis. It is generally agreed that almost all venous ulcers are associated with incompetent perforating veins, and probably the majority of uncomplicated varicose veins have a similar association, though it should be remembered that the junctions of the long saphenous vein and femoral vein, and the short saphenous vein and popliteal vein, are, physiologically, perforating veins. Incompetence at these sites can have just the same effect as incompetence of the valves of the small connecting veins in the lower thigh and leg, the veins usually associated with the term "perforating veins."

Therefore the logical method of treating varicose veins is to occlude the incompetent connecting veins between the superficial and deep systems and so restore the pressure and flow in the superficial veins to normal.

The problem for the clinician, whatever method he ultimately uses to obstruct the perforating veins, is to find out where they are. In this issue of the B.M.J. Mr. K. D. Patil and his colleagues review the existing methods for detecting incompetent perforating veins and describe a new technique (page 195). Their study emphasizes what a number of other workers have found—namely, that clinical diagnosis is a very poor guide. At their best our fingers and eyes will detect only 60% of perforating veins, and this deficiency has stimulated the search for new methods of diagnosis. The surgeon who relies solely on physical examination or a knowledge of the standard anatomical description of the sites of the perforating veins will inevitably miss a large number.

We have had one reliable method of diagnosis, phlebography, for many years, but this has not been adopted as a common method of investigation because it is time-consuming, sometimes uncomfortable for the patient, occasionally painful, and difficult to interpret. The main disadvantage of phlebography is the difficulty of relating the site of the perforating vein on the two-dimensional radiograph to its true site in the three-dimensional leg.

The detection of incompetent perforating veins by phlebography and the thermographic method described by Patil and colleagues depends on the primary physiological abnormality of varicose veins—namely, the reversed flow of blood from the deep to superficial systems. It is therefore not surprising that both methods are extremely accurate, and the thermographic method has the added advantage of being simple, completely painless, and not too time-consuming. It takes only five minutes to display one incompetent perforating vein, and both legs can be examined in less than an hour, no longer than it takes to obtain a phlebogram.

Because of the simplicity of the test thermographic localisation methods are now widely used for surgical planning.

6. Abbott's article is mentioned in the context of identifying new methods for detecting pyuria in infants.