Ultrasonography of the advanced tuberculous kidney

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Summary

Ultrasonography is a quick and non-invasive method of evaluating the kidney which cannot be seen on excretory urography. If advanced renal tuberculosis is the reason, then ultrasonography is frequently diagnostic.

The ultrasonographic findings in renal tuberculosis have rarely been published. This diagnostic tool is relatively inaccurate in demonstrating the early changes in renal tuberculosis, excretory urography being superior for demonstrating the papillary and calyceal erosive changes. When the collecting system of a kidney cannot be seen on excretory urography, ultrasonography is generally accepted to be the next most useful mode of investigation since it readily permits visualisation of the renal cortex, medulla, calyces and renal pelvis. Hydronephrosis and renal masses are usually demonstrable.

The ultrasonographic findings in 9 tuberculous kidneys, which could not be seen on excretory urography, are presented and the diagnostic features evaluated.

Patients and methods

The ultrasonographic findings in 9 patients who had kidneys surgically proven to have advanced tuberculous disease were reviewed. Before surgery each patient had an excretory urogram during which the collecting system of the involved kidney could not be seen. The patient subsequently underwent renal ultrasonography. This was performed using a standard real-time grey-scale ultrasound scanner with a 3.5 MHz transducer.

Results

The ultrasonographic appearances of the tuberculous kidneys could be divided into two main groups: (i) 2 kidneys with a normal ultrasonographic appearance despite extensive tuberculous involvement; and (ii) 7 kidneys with dilated calyces (caliectasis) secondary to intrarenal stricturing in which no renal pelvis could be identified.

Dilated calyces with well-defined walls were demonstrated in 3 kidneys (Fig. 1), whereas 4 kidneys had irregular poorly defined calyceal walls and contained debris (Fig. 2). The size of the kidneys was variable; 2 were small and contracted, 3 were within normal limits and 2 were large. One patient had computed tomography, which confirmed the presence of calic-
health, such as night sweat, malaise, flank pain and low grade fever. Urological findings include pyuria, albuminuria and haematuria. The principal means of diagnosis of renal tuberculosis is by the isolation of Mycobacterium tuberculosis from the urine. 4

Renal tuberculosis results from haematogenous spread from the primary source of infection. Both kidneys are usually seeded with tubercle bacilli. Renal tuberculosis may not manifest itself for a long period. Latent periods from 1 month to over 20 years have been described. 5, 6 The disease is almost always bilateral, although destructive changes are often confined to one kidney. 6 The destructive changes may progress silently for years before the diagnosis. The definitive lesion is thought to form in the loop of Henle. 7 The granulomatous lesions may enlarge and coalesce with extension into the adjacent renal tissues. Granulation tissue involving the mucosa of the renal collecting system leads to thickening, which — together with fibrotic shortening — results in narrowing of the strictureing of the infundibuli and subsequently the renal pelvis. 8 Obstructive caliectasis involving one or more calyces results. Ultrasonography is readily able to identify the caliectasis. The walls of the distended calyces may be well defined or poorly defined and contain debris. Layering of the debris may occur. Ultrasonography can identify an associated non-distended renal pelvis accurately. This observation is of help in differentiating intrarenal tuberculous stricturing with calyectasis and a contracted renal pelvis from a simple non-complicated hydronephrotic kidney in which a distended renal pelvis is demonstrable.

Other disease processes involving the kidney may result in caliectasis without apparent distension of the renal pelvis. These include transitional cell tumour of the renal pelvis and xanthogranulomatous pyelonephritis. 9 A tumour mass or calculus may be demonstrable on ultrasonography, thus helping to differentiate these conditions from the tuberculous kidney. 10

Diffuse miliary or nodular renal tuberculosis without stricturing may result in a kidney that cannot be seen on excretory urography, but has a normal appearance on ultrasonography. Acute bacterial pyelonephritis may also result in a kidney that cannot be seen on urography, but associated ultrasonographic changes have been described. 11 Therefore a kidney that cannot be seen on excretory urography and which has a normal ultrasonographic appearance suggests tuberculosis.

REFERENCES