

## LESSON OF THE MONTH

### Do not be Fooled by Angiography in Renovascular Disease

Y. C. Chan<sup>1</sup>, M. A. O. Al-Kutoubi<sup>2</sup> and J. H. N. Wolfe<sup>3</sup>

<sup>1</sup>Senior House Officer Regional Vascular Unit, <sup>2</sup>Consultant Radiologist,

<sup>3</sup>Consultant Vascular Surgeon Regional Vascular Unit, St Mary's Hospital, London W2 1NY, U.K.

#### Case Report

A 73-year-old hypertensive gentleman who had previously undergone an infrarenal abdominal aortic aneurysm repair presented with thoracic back pain. Abdominal examination revealed a non-tender, pulsatile mass in the epigastrium. There were no carotid bruits and he had a full complement of supra-aortic and infrainguinal pulses.

Intra-arterial digital subtraction angiography revealed a type II thoracoabdominal aortic aneurysm down to the level of the previous infrarenal graft, associated with apparent stenoses of the renal arteries (Fig 1). Contrast enhanced computed tomographic (CT) scanning of the aorta showed that these "stenoses" were due to narrow channels in the thrombus of the aneurysm, and not true arterial stenoses (Fig. 2).

#### Discussion

Renovascular hypertension results when there is decreased blood flow to the kidneys, with subsequent activation of the renin-angiotensin system.<sup>1</sup> It is one of the most important surgical causes of hypertension and such patients should be managed by a team consisting of hypertension specialists, vascular physicians, vascular surgeons and interventional radiologists. Accurate imaging of the renal vasculature is essential for the proper selection of those individuals who might benefit from revascularisation by means of angioplasty or surgery.

Many tests are now available for the evaluation of

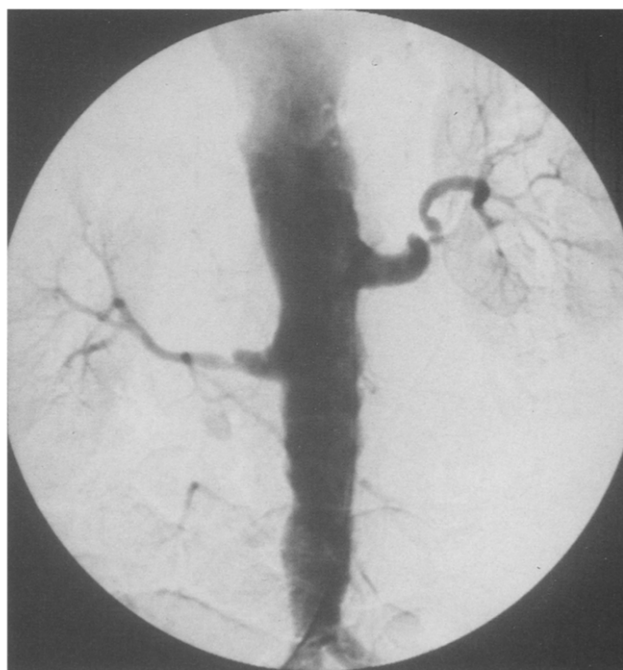


Fig. 1. Angiogram of thoracoabdominal aortic aneurysm revealing apparent stenoses in the middle segment of the renal arteries bilaterally.

renovascular disease. Non-imaging tests, such as renal vein renin sampling, captopril testing and captopril scanning,<sup>2</sup> all have their limitations. Amongst the imaging tests, such as Doppler ultrasonography, magnetic resonance imaging<sup>3</sup> and angiography, contrast angiography is still regarded by many as the best.

Digital subtraction angiography is a relatively straightforward and accurate method for evaluating patients with renovascular disease. When performed by experienced radiologists, renal artery stenoses of

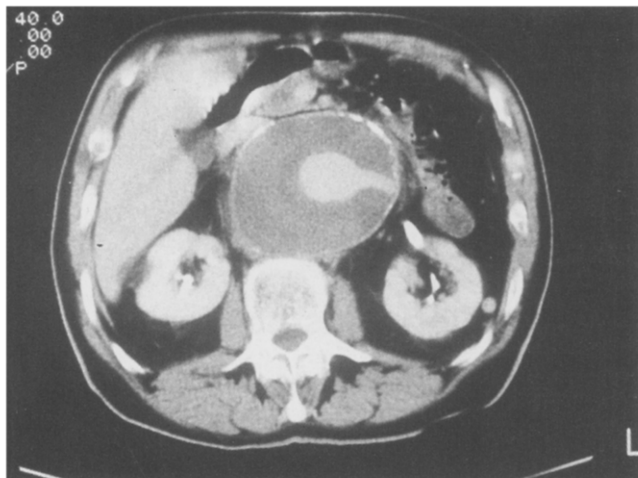


Fig. 2. CAT scan of thoracoabdominal aortic aneurysm showing thrombus and the lumen. There is a track through the thrombus to the origin of the left renal artery.

at least 70% were accurately assessed in 95% of cases.<sup>4</sup> Although it is a good way to distinguish fibromuscular disease from atherosclerosis, it might be less sensitive in differentiating ostial from truncal renal stenosis. Angiography alone would not be adequate in assessing renal artery stenosis in the presence of concurrent aortic disease.

With the recent introduction and continual development of helical computed tomography, this technique could replace angiography as a screening tool in patients with renovascular disease. Early experience suggests that spiral CT scanning, especially when used in combination with colour Doppler ultrasonography, may be more useful than angiography in evaluating renal arteries and their relationship to aortic disease.<sup>5</sup> In our case, whereas angiography shows an apparent truncal renal stenosis, CT might demonstrate more clearly the patho-anatomy of these pseudotruncal ostial stenoses in the thrombus of the aneurysm. We therefore recommend that spiral CT should always be used in preference, or in addition, to angiography in assessing aneurysm patients with renovascular disease.

### References

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