

Clinics in Diagnostic Imaging (36)

Y M Tan, S K H Yip, M K Li

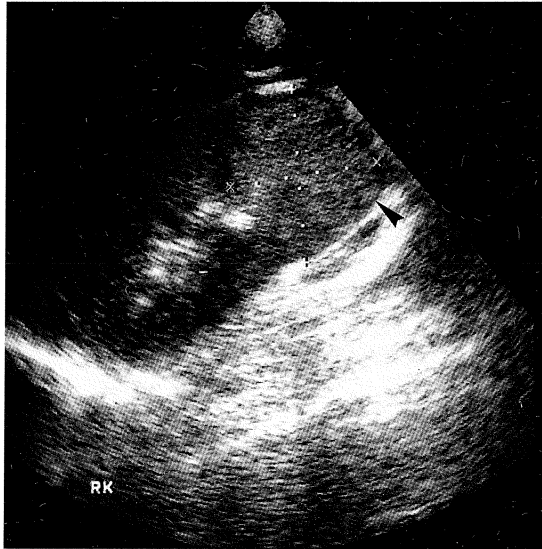


Fig 1 – Ultrasound scan of the right kidney.

CASE PRESENTATION

A 50-year-old Indian man presented with a three-day history of dyspepsia and non-specific right-sided abdominal pain. He reported no other gastrointestinal or genitourinary symptoms. He was a known diabetic, a non-smoker and had limited alcohol intake of 2 units per week. On physical examination, he was noted to be thin but there was no evidence of pallor, jaundice or lymphadenopathy. His abdomen was soft with no palpable masses. Laboratory studies were unremarkable.

Initial ultrasound scan was performed to exclude a hepatobiliary lesion. No gallstones or biliary duct dilatation was detected. What does the ultrasound scan of the right kidney show (Fig 1)? Computed tomography (CT) was subsequently done (Fig 2). What other forms of imaging would be useful?

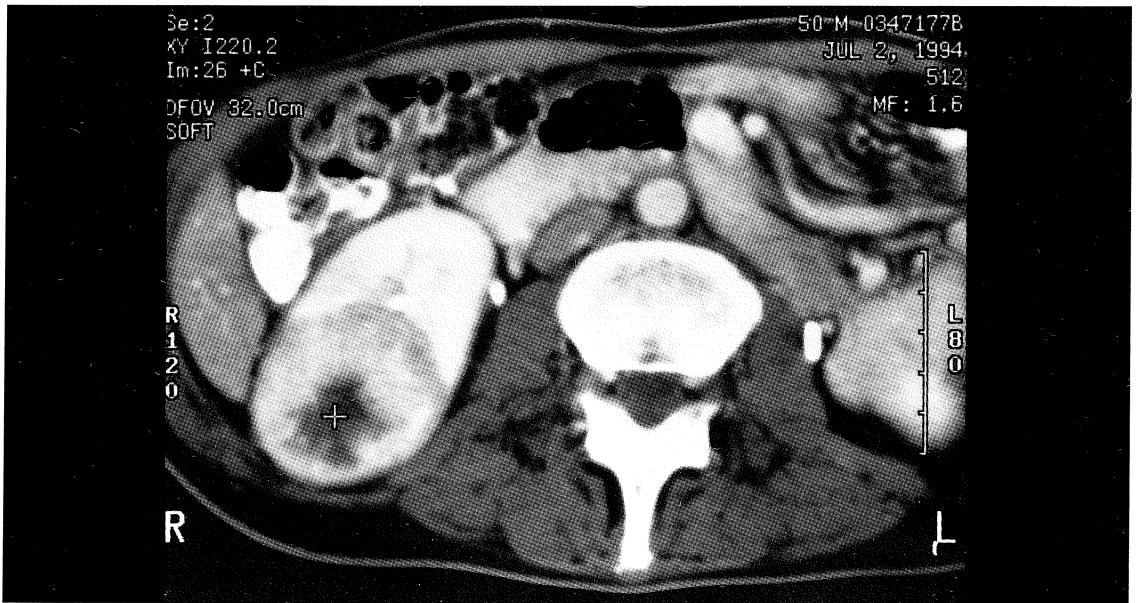


Fig 2 – Contrast-enhanced CT scan of the kidneys.

Department of Urology
Singapore General Hospital
Outram Road
Singapore 169608

Y M Tan, BSc (Hons), MBBS
Medical Officer

S K H Yip, MBBS, FRCS (Edin),
FHKAM (Surgery), FAMS
(Urology)
Senior Registrar

Division of Urology
National University Hospital
5 Lower Kent Ridge Road
Singapore 119074

M K Li, MBBS, FRCSI,
FRCS (Glas), FACS,
FAMS (Urology)
Senior Consultant & Head

Correspondence to:
Dr S K H Yip

IMAGE INTERPRETATION

On the abdominal ultrasound, a solid echogenic mass was seen at the inferior pole of the right kidney (arrowed). Such a mass is highly suggestive of a renal tumour and the next appropriate investigation should be computed tomography of the kidneys.

CT scan (Fig 2) revealed a 5cm rounded mass with distinct margins and smooth contour in the posterior inferior aspect of the right kidney. There was a central stellate low-density scar within the lesion. The surrounding renal fascial fat planes appeared intact. Both the right renal vein and inferior vena cava were free of thrombus. The left kidney was normal. No para-aortic lymph node was evident.

Renal angiogram (Fig 3) showed a hypovascular mass in the lower pole of the right kidney measuring 5 cm in diameter. The lesion had well-defined borders and a parenchymal blush. There was no evidence of renal vein involvement, arteriovenous shunting or contrast puddling.

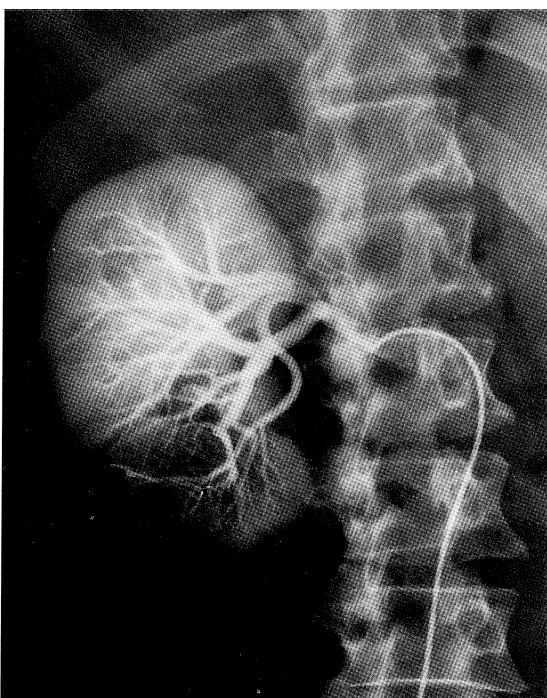


Fig 3 – Pre-operative renal angiogram shows a well-defined hypovascular lesion in the right lower pole (arrows).

DIAGNOSIS

Renal oncocytoma

CLINICAL COURSE

The patient subsequently had a surgical exploration of the right kidney via a loin approach. Findings were that of an well-encapsulated ruddy tan mass in the right lower pole (Fig 4). Frozen section confirmed the initial diagnosis of a renal oncocytoma and a partial nephrectomy was performed. Post-operative recovery was uneventful until the 11th post-operative day when the patient began to have several episodes of gross haematuria and clot retention. He was managed with catheterisation, a bladder washout and blood transfusion. A repeat angiogram revealed a large pseudoaneurysm with arteriovenous fistula (Fig 5) at the operative site, and the feeding vessel was embolised



Fig 4 – Specimen photograph of the excised tumour. Cross-section of the well-circumscribed oncocytoma (arrows).

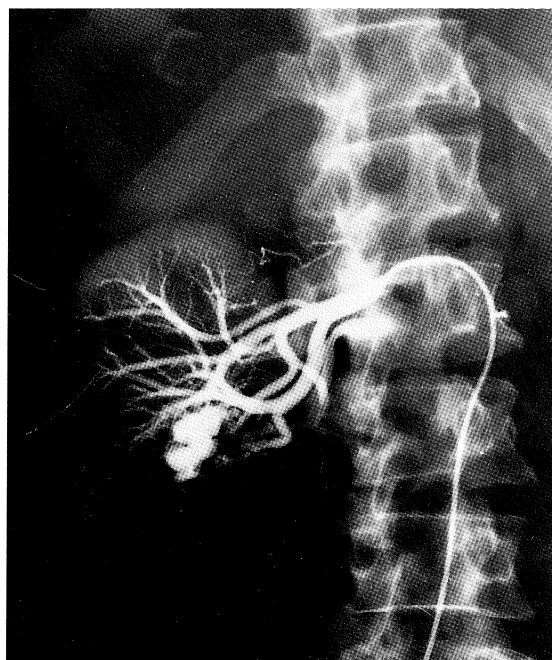


Fig 5 – Post-operative renal angiogram. Arteriovenous fistula is seen at the right lower pole after partial nephrectomy.

with 6 metallic coils. The haematuria settled and the patient was discharged on the 20th post-operative day. At 40 months follow up, the patient is in excellent health with no evidence of recurrence.

DISCUSSION

The discovery of renal oncocytomas is frequently incidental. Its incidence is estimated at about 4.3% of all renal tumours⁽¹⁾. The clinical course is almost invariably benign in the majority of cases and the prognosis in the long term is extremely favorable⁽²⁾. However, even with the vast improvements in imaging evaluation, expectant management of such lesions is not advocated because there are no pathognomonic urological imaging studies specific for diagnosis. Hence, for the assessment of asymptomatic renal

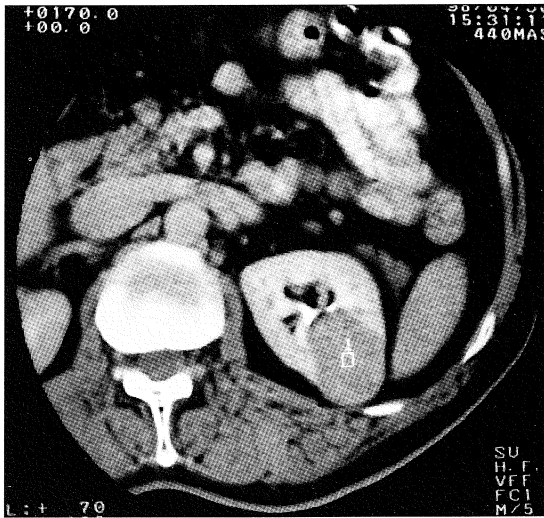


Fig 6 – Contrast-enhanced CT scan of the left kidney of a patient with renal cell carcinoma who subsequently underwent partial nephrectomy.

masses, the diagnosis of a renal cell carcinoma cannot be discarded.

Our report displays the features of a typical oncocytoma seen on CT, which include homogeneous enhancement, smooth well-defined borders and a central stellate scar. The features of renal cell carcinoma would include irregular margins with invasion of adjacent soft tissue and viscera, calcification within the lesion, and involvement of the renal vein and inferior vena cava by tumour. For comparison, the CT scan of an incidental renal cell carcinoma, which had undergone a partial nephrectomy at our institution, is shown (Fig 6). Since the initial case report of CT features of a renal oncocytoma⁽³⁾, extensive studies with CT have failed to reliably differentiate oncocytomas from renal cell carcinomas. Davidson and colleagues reviewed 53 cases of oncocytoma and 63 cases of adenocarcinomas but only found 67% of oncocytomas to fulfill the criteria whereas 16% of adenocarcinomas were incorrectly predicted to be oncocytomas⁽⁴⁾.

Invasive vascular techniques such as angiography can also be useful in the diagnostic workup but are not performed on a routine basis, especially with the advent of CT. Angiographically, there are no pathognomonic features for oncocytomas⁽⁵⁾. The lesion would be expected to have a sharp, smooth rim and parenchymal blush (see Fig 3). It is classically described to have a vascular supply arranged in a 'spoke-wheel' pattern with the vessels radiating towards the center of the lesion. This by no means specific since renal cell carcinomas may also have this feature. The need for tissue diagnosis remains paramount in solid renal lesions. Although radiologically-guided aspiration biopsies have been evaluated, their practical value is limited by the uncertainties of histological classification, the potential for sampling error and the potential risk of seeding the biopsy tract should the specimen turn out to be a carcinoma.

The role of nephron-sparing surgery in the management of small, polar lesions in a young patient

is the emerging standard of care with the increasing discovery of incidental lesions using non-invasive forms of imaging such as ultrasound and CT. Criteria proposed by Licht et al⁽⁶⁾ from a retrospective analysis of 216 cases of incidental renal lesions for which partial nephrectomy was performed suggest that this approach is an acceptable and safe option, despite its technical demands. The rate of technical or renal related complications is quoted at 30% in an institutional series by Campbell and colleagues⁽⁷⁾ with urinary fistula, acute renal failure, wound infection and haemorrhage being most common. High-risk characteristics include a solitary kidney, or a large and centrally located tumour. In our case, if the tumour was more central and encroaching on the renal hilar vasculature, a radical nephrectomy might have been a more appropriate form of treatment⁽⁸⁾. The arteriovenous fistula that we encountered post-operatively was effectively diagnosed and treated by embolisation. In this circumstance, interventional vascular radiological techniques remain a safe first line option to negate the requirement for repeat open surgery.

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ABSTRACT

A 50-year-old Indian man presented with non-specific right-sided abdominal pain. Ultrasound of the abdomen demonstrated a small right renal tumour. Computed tomography showed features suggestive of a benign renal oncocytoma. This was confirmed by frozen section during surgical exploration. A partial nephrectomy was carried out. The role and limitations of imaging in the management of solid renal masses is discussed.

Keywords: oncocytoma, computed tomography, angiography, partial nephrectomy, renal mass