CASE REPORT

Renal granular cell tumour (Abrikossoff tumour): case report and review of the literature

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ABSTRACT. A 52-year-old female was referred to our institute for an incidental renal mass. A homogeneously enhancing mass was detected on multidetector CT (MDCT) imaging. Histologically, the tumour was consistent with granular cell tumour (GCT). GCT is a benign tumour that often involves the skin and subcutaneous tissue. Rarely has it been reported to involve the genitourinary system. Here we present the first reported case of GCT with renal involvement along with its MDCT imaging features. The authors also present a review of the literature along with a review of typical MDCT imaging features of enhancing renal masses with emphasis given to renal cell carcinoma and its varying subtypes.

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Granular cell tumour (GCT) is a benign tumour thought to be of neural cell origin that occurs frequently in skin and subcutaneous tissue. Genitourinary involvement has been rarely reported. We report a case of a renal granular cell myoblastoma mimicking renal cell carcinoma on multidetector CT (MDCT) imaging, which to our knowledge has not been reported before.

Case report

In May 2007, a 52-year-old female was referred to our institute with a mass in her right kidney. She had obtained a triple-phase renal CT because of haematuria following surgery for severe outlet obstruction. She was otherwise asymptomatic at this time. MDCT revealed an exophytic mass in the upper pole of the right kidney (Figure 1). The dimensions of the tumour were 2.0 × 1.8 cm at its largest diameter.

The lesion had a higher attenuation than renal parenchyma on an unenhanced scan (Figure 1a), and enhanced homogeneously following intravenous (iv) contrast administration in the corticomedullary phase (Figure 1b). The lesion washout was rapid in the nephrographic phase (Figure 1c) and remained hypodense relative to renal parenchyma in the excretory phase (Figure 1d). There was no evidence of metastatic disease. Based on these imaging findings, our differential diagnosis favoured

clear cell renal cell carcinoma (RCC) over a benign renal neoplasm, such as an oncocytoma, and an open partial nephrectomy was performed.

Histologically, the tumour showed sheets and nests of polygonal cells with eosinophilic granular cytoplasm (Figure 2a,b). Immunohistochemistry analysis was positive for vimentin, S-100 and neuron-specific enolase (NSE), which was also most consistent with GCT (Figure 2c). Electron microscopy revealed numerous cytoplasmic lysosomes (Figure 2d), a finding characteristic of GCT. The diagnosis of renal GCT was made based on these findings. The patient has been disease free for over 1 year with no evidence of recurrence.

Discussion

GCT was first reported by Abrikossoff in 1926 [1]. It is predominantly a benign neoplasm believed to originate from neural cells [2]. These tumours are found primarily in the oral region (*i.e.* tongue, buccal mucosa and hard palate), head and neck [2, 3]. Of these masses, only 1–3% are malignant [3]. In a review of the literature, genitourinary involvement is rare with only 1 report involving the ureter and 11 involving the bladder [4].

Our patient presented with an exophytic homogeneously enhancing mass on MDCT without signs of metastasis. Although imaging cannot predict histology, the differential for an enhancing renal mass include RCC and oncocytoma, of which the former is more common. This information is especially important since 50–70% of renal tumours are now discovered incidentally on cross-sectional study [5].

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Figure 1. (a) Unenhanced (arrowhead), (b) corticomedullary, (c) nephrographic and (d) excretory phase CT images revealing a homogeneously enhancing renal mass that had peak enhancement in the corticomedullary phase with rapid washout in the nephrographic phase.

RCC subtypes may include clear cell (55–80%), papillary (10–20%), chromophobe (4–12%) and collecting duct (<1%) [5, 6]. Clear cell RCC generally displays a heterogeneous enhancement pattern owing to a mixture of solid enhancing soft-tissue components that may be interspersed with haemorrhage, necrotic and cystic changes [5–7]. This subtype has peak enhancement in the corticomedullary phase and generally has higher average enhancement compared with other RCC subtypes on both corticomedullary phase and nephrographic phases [5, 6]. The 5 year survival for clear-cell RCC is 70% [5, 6].

Papillary RCC is subdivided into Types I and II based on histological criteria. These lesions are almost always hypovascular, and with typical peak enhancement in the corticomedullary phase well under 100 HU (average 60–70 HU) [5, 8]. Chromophobe RCC displays a dominantly homogeneous and moderate enhancement pattern, intermediate between papillary and clear cell RCC [5, 6]. Both papillary and chromophobe RCC have a more favourable 5 year survival rate (80–90%) [5].

Collecting duct RCCs, the most aggressive of RCC subtypes, tend to enhance heterogeneously with a typically infiltrative growth pattern, atypical of other subtypes [6]. Regarding benign renal masses, oncocytomas may be heterogeneous or homogeneous and enhance in a similar way to clear cell RCC [5]. In a minority of cases, these lesions have central non-enhancing scars. However, they are difficult to distinguish, by imaging alone, from clear-cell RCC in most cases. Percutaneous biopsy to distinguish these lesions is promising at major centres [9, 10]. While seeding may be a potential complication, this has not been reported in any contemporary series [9, 10].

Conclusion

Although the differential for enhancing renal masses are broad, radiologists should become familiar with imaging features of varying subtypes to assist in planning treatment options and counselling patients.

Figure 2. Granular cell tumour under light microscopy at (a) $\times 10$, (b) $\times 40$, (c) S100 staining at $\times 20$, and (d) electron microscopy revealing nests of polygonal cells under light microscopy, positive S-100 staining and numerous cytoplasmic lysosomes.

Here we have described the first case report and imaging features of GCT with renal involvement, a benign tumour.

References

1. Abrikossoff A. Über myome ausgehend von der quergestreiften willkürlichen muskulatur. *Virchows Arch Pathol* 1926;260:215–23.
2. D'Andrea V, Ambrogi V, Biancari F, De Antoni E, Di Matteo G. Granular cell myoblastoma (Abrikossoff tumour) of the chest wall: a never described site of a rare tumour. *J Thorac Cardiovasc Surg* 1994;108:792–3.
3. Junquera LM, de Vicente JC, Vega JA, Losa JL, Albertos JM, López-Arranz JS. Granular-cell tumours: an immunohistochemical study. *Br J Oral Maxillofac Surg* 1997;35:180–4.
4. Madi R, Gokden N, Greene G. Granular cell tumour of the ureter: first case reported. *Can Urol Assoc J* 2009;3:156–8.
5. Zhang J, Lefkowitz RA, Ishill NM, Wang L, Moskowitz CS, Russo P, et al. Solid renal cortical tumours: differentiation with CT. *Radiology* 2007;244:494–504.
6. Prasad SR, Humphrey PA, Catena JR, Narra VR, Srigley JR, Cortez AD, et al. Common and uncommon histologic subtypes of renal cell carcinoma: imaging spectrum with pathologic correlation. *Radiographics* 2006;26:1795–806.
7. Bach AM, Zhang J. Contemporary radiologic imaging of renal cortical tumours. *Urol Clin North Am* 2008;35:593–604.
8. Ruppert-Kohlmayr AJ, Uggowitzer M, Meissnitzer T, Ruppert G. Differentiation of renal clear cell carcinoma and renal papillary carcinoma using quantitative CT enhancement parameters. *AJR Am J Roentgenol* 2004;183:1387–91.
9. Wood BJ, Khan MA, McGovern F, Harisinghani M, Hahn PF, Mueller PR. Imaging guided biopsy of renal masses: indications, accuracy and impact on clinical management. *J Urol* 1999;161:1470–4.
10. Silverman SG, Israel GM, Herts BR, Richie JP. Management of the incidental renal mass. *Radiology* 2008;249:16–31.