CASE REPORT

Retroperitoneal oncocytoma: case report and review of the imaging features

¹A A ROY, MRCS, DOHNS, ²C JAMESON, FRCPath, ³T J CHRISTMAS, FRCS and ¹S ASLAM SOHAIB, MRCP, FRCR

¹Department of Radiology, ²Department of Pathology and ³Department of Surgery, The Royal Marsden NHS Trust, London, UK

ABSTRACT. Oncocytomas are uncommon tumours that occur in a number of specific anatomical locations within the head, neck, chest, abdomen and pelvis. When occurring in the retroperitoneum, oncocytomas almost always arise from either the kidney or adrenal gland. With this case we present the imaging findings of an exceptionally rare retroperitoneal oncocytoma whose site of origin is neither the kidney nor adrenal gland.

Received 10 May 2010
Revised 29 September 2010
Accepted 22 October 2010
DOI: 10.1259/bjr/63620790

© 2011 The British Institute of Radiology

Oncocytomas are neoplasms with characteristic cellular compositions; histologically they comprise oncocytes — epithelial cells with abundant eosinophilic granular cytoplasm that can be arranged in a number of patterns [1]. Oncocytomas have rarely been reported in a number of distinct anatomical locations including the kidney, lung, breast, ovary, liver, gut, prostate gland and various sites in the head and neck including the pituitary, thyroid and salivary glands [2, 3]. When present in the retroperitoneum, such lesions arise from either the kidney or the adrenal gland [4]. Whilst renal oncocytomas are a well-described although uncommon entity, oncocytomas arising from the adrenal gland are exceptionally rare; approximately 25 cases have been reported in the English-language literature. Discrete oncocytomas arising within the retroperitoneum but anatomically distinct from both kidney and adrenal gland are rarer still; there have been just two reported cases and in both an origin from heterotopic adrenocortical “rest” tissue has been postulated. We present the case of a previously healthy male patient with a histologically proven retroperitoneal oncocytoma and review the imaging features of this rare clinical entity.

Case report

A 42-year-old male dance instructor presented with an insidious history of vague left-sided upper abdominal discomfort. His medical history was unremarkable and he took no regular medication. On examination he was afebrile with a pulse of 60 beats min⁻¹, blood pressure of 105/60 mmHg and respiratory rate of 14 min⁻¹. His

abdomen was soft with a palpable mass in the left upper quadrant. Initial blood tests were unremarkable and a screen for urinary catecholamines was negative. A contrast-enhanced CT scan of his abdomen showed a 16 cm, largely homogeneous, well-circumscribed retroperitoneal mass anatomically located superior to his left kidney (Figure 1). No further sites of disease were identified.

The patient underwent removal of the mass under general anaesthesia via a combined abdominal and thoracic approach (Figure 2). The left adrenal gland was separately identifiable from the large mass but was adherent to it; it was thought likely to be its site of origin and was thus also removed. The histology specimen revealed a 16 cm, 1344 g mass and a separate but stuck-down adrenal gland. No haemorrhage or necrosis was seen within the large tumour and sections demonstrated an exclusive composition of cells with abundant granular eosinophilic cytoplasm (Figure 3). There was mild nuclear pleomorphism and numerous nuclear pseudoinclusions. No mitotic figures or features of vascular invasion were identified. The tumour cells stained positive for Vimentin and focally positive for AE1/AE3 but negative for Melan-A, Calretinin, NSE, Inhibin, S-100, EMA, Synaptophysin and Chromogranin. The adherent left adrenal gland measuring 35 × 25 × 8 mm contained normal adrenal parenchyma. The tumour appearances were concluded to be those of an oncocytoma. However, the adrenal gland and left kidney appeared anatomically distinct and thus its tissue of origin was not immediately clear.

Discussion

The vast majority of suprarenal tumours arise from the adrenal gland and very rarely from retroperitoneal tissues. Of the adrenal tumours the so-called adrenal

Address correspondence to: Dr Amit Roy, Department of Radiology, The Royal Marsden Hospital, London, SW3 6JJ, United Kingdom. E-mail: amit.roy@bartsandthelondon.nhs.uk

(a)

(b)

Figure 1. (a) Axial contrast-enhanced CT image through the large retroperitoneal tumour demonstrating a well-demarcated, largely homogeneous mass with some internal vascularity. (b) Coronal contrast-enhanced CT image through the abdomen demonstrating the large well-circumscribed homogeneous mass lying superior to the left kidney.

“incidentalomas” have been estimated to occur in as many as 3–5% of patients undergoing abdominal cross-sectional imaging for unrelated clinical indications [5, 6]. The overwhelming majority of such lesions are benign adrenal adenomas. Other adrenal tumours include myelipomas, adrenal cysts, ganglioneuromas, carcinomas, phaeochromocytomas and metastases [6]. The clinical behaviour, imaging features and management for all these tumours is well established [7]. Adrenal oncocytomas are vanishingly rare and thus no clear consensus has been

reached regarding their typical clinical behaviour and optimal management. The small number of described cases point towards a slight female predominance and slight predilection for the left side [1, 2, 8]. The vast majority of reported cases describe histologically benign, biochemically non-functioning lesions. However, there have been reports of functional oncocytomas including one of a child presenting with pseudoprecocious puberty

Figure 2. Photograph of the sectioned tumour. A solid, light to dark brown well-circumscribed tumour with a surrounding capsule.

Figure 3. Microscopy slide. Sheets of large polygonal cells with abundant eosinophilic granular cytoplasm and small nuclei.

[9]. In addition, frankly malignant oncocytomas have been described [2]. Bisceglia et al [1] have devised a classification system based on criteria such as lesion size, mitotic rate and capsular invasion in order to identify those oncocytomas with malignant potential [2].

In our case, the excised tumour demonstrated the cytological and ultrastructural hallmarks of an oncocytoma and yet the kidney and adrenal gland appeared separate from it. In addition, evidence of normal-appearing adrenal tissue was seen related to the capsule of the tumour. One explanation for these findings is that the tumour originated within heterotopic adrenal "rest" tissue within the retroperitoneum [4]. To date, there have only been two reports of retroperitoneal oncocytomas arising from adrenal rests [4, 10]. We believe this is a further example of such a case.

The mass presented as a large solid heterogeneous, hypervascular lesion on ultrasound without evidence of calcification. On contrast-enhanced CT scanning, a capsulated, very well-defined mass was identified with the absence of associated locally aggressive features. The absence of calcification and fat density aided differentiation from other entities such as adrenal myelolipoma. A reported case of adrenal oncocytoma commented on a mass which was isointense to normal adrenal tissue on T_1 weighted and T_2 weighted MRI with decreased relative enhancement to the normal adrenal gland following intravenous gadolinium [9]. These radiological features have also been described in renal and adrenal oncocytomas. The specific finding of a central fibrous scar, giving rise to a "spoke-wheel" pattern on ultrasound, CT or MRI, which is thought to be seen in up to one-third of cases of renal oncocytoma [6, 9], was not a feature in our case.

In summary we describe the imaging features of retroperitoneal oncocytoma. The imaging appearances of this very rare tumour have many similarities to the more common entity of renal oncocytoma.

Acknowledgments

Dr Sohaib, Dr Jameson and Mr Christmas are supported by RMH/ICR NIHR Biomedical Research Centre Funding.

References

1. Bisceglia M, Ludovico O, Di Mattia A, Ben-Dor D, Sandbank J, Pasquinelli G, et al. Adrenocortical oncocytic tumors: report of 10 cases and review of the literature. *Int J Surg Pathol* 2004;12:231–43.
2. Juliano JJ, Cody RL, Suh JH. Metastatic adrenocortical oncocytoma: A case report. *Urol Oncol* 2008;26:198–201.
3. Xiao GQ, Pertsemlidis DS, Unger PD. Functioning adrenal oncocytoma. A case report and review of the literature. *Ann Diagn Pathol* 2005;9:295–7.
4. Corsi A, Riminucci M, Petrozza V, Collins MT, Natale ME, Cancrini A, et al. Incidentally detected giant oncocytoma arising in retroperitoneal heterotopic adrenal tissue. *Arch Pathol Lab Med* 2002;126:1118–22.
5. Ross NS, Aron DC. Hormonal evaluation of the patient with an incidentally discovered adrenal mass. *N Engl J Med* 1990;323:1401–5.
6. Botsios D, Blouhos K, Vasiliadis K, Asimaki A, Tsalis K, Betsis D. Adrenocortical oncocytoma – A rare tumour of undefined malignant potential: report of a case. *Surg Today* 2007;37:612–17.
7. Patel HR, Harris AM, Lennard TW. Adrenal masses: the investigation and management of adrenal incidentalomas. *Ann R Coll Surg Engl* 2001;83:250–2.
8. Poretti D, Mazzarol G, Bonomo G, Casadio C, Bellomi M. Adrenocortical oncocytoma case report. *Clin Imaging* 2003;27:426–30.
9. Tahar GT, Nejib KN, Sadok SS, Rachid LM. Adrenal oncocytoma: a case report and review of the literature. *J Pediatr Surg* 2008;43:E1–3.
10. Nguyen GK, Vriend R, Ronaghan D, Lakey WH. Heterotopic adrenocortical oncocytoma. A case report with light and electron microscopic studies. *Cancer* 1992;70:2681–4.