Clinical Imaging 39 (2015) 695–698

Contents lists available at ScienceDirect

Clinical Imaging

journal homepage: http://www.clinicalimaging.org

Adrenal renal fusion confusion: a case report of an adrenal cortical adenoma with adrenal–renal fusion

Shannon St. Clair [a,*], Stephen Machnicki [a], Alyssa Yurovitsky [b]

[a] Lenox Hill Hospital Radiology Department
[b] Lenox Hill Hospital Pathology Department

ARTICLE INFO

Article history:
Received 17 November 2014
Accepted 30 December 2014

Keywords:
Adrenal–Renal fusion
Adrenal cortical adenoma
MR imaging adrenal cortical adenoma with adrenal–renal fusion
Benign tumor

ABSTRACT

We report a case of laminaria hypersensitivity treated with diphenhydramine and corticosteroids. A literature review identified 10 previously reported cases, with 8 recognized as anaphylaxis, and good outcomes with corticosteroids and antihistamines despite limited epinephrine utilization. Laminaria hypersensitivity is likely IgE mediated with an increased anaphylaxis risk with prior exposure.

A 61-year-old male presented to the emergency department with abdominal pain. The physical exam demonstrated right lower quadrant tenderness without palpable mass. Laboratory analysis of blood and urine were normal. A CT of the abdomen and pelvis with oral and intravenous contrast was ordered to evaluate for appendicitis. Incidentally, a 2.5-cm mass projecting superiorly from the upper pole of the left kidney was found [Figs. 1–2]. The mass was heterogeneous and appeared to have enhancing components. The lesion was felt to be suspicious for renal neoplasm.

Several days later, the patient had an MRI of the kidneys to further evaluate the mass [Fig. 3–6]. The mass was hypointense relative to the kidney on T2-weighted images, did not lose signal on out-of-phase gradient echo images, and demonstrated low-level enhancement as compared with the renal cortex. In general, solid lesions that show signal intensity lower than that of renal cortex on T2-weighted images include papillary renal cell carcinoma (RCC), angiomyelolipoma with minimal fat and, rarely, clear cell RCC. Papillary RCC has been shown to enhance to a much lesser degree than the renal cortex does on both corticomedullary and nephrographic phases, making the main diagnostic consideration of such lesions papillary RCC [1,2].

The patient was taken to surgery to have the suspected renal neoplasm removed. At surgery, the mass was noted to arise from the left adrenal gland. The mass, along with the left adrenal gland and a small portion of the upper pole of the left kidney were resected. Histologically, there was a 1.5-cm adrenal cortical neoplasm with largely circumscribed borders, adherent to the adjacent normal kidney [Fig. 7]. The benign tumor was heterogeneous in appearance and lacked vascular invasion, mitoses, and necrosis. Immunohistochemical stains supported the adrenal cortical origin (Inhibin, Synaptophysin and Melan-A positive). Therefore, the diagnosis of adrenal cortical adenoma with adrenal–renal fusion was made. Retrospective review of the CT and magnetic resonance (MR) images demonstrates that the lateral limb of the left adrenal gland is continuous with the mass.

Adrenal–Renal fusion is a rare finding which was first described by Rokitansky in his Manual of Pathological Anatomy text in 1855 [3]. The true incidence of adrenal–renal fusion is unknown and, prior to the common usage of multiplanar reformatted CT images, has been reported largely as an incidental finding in nephrectomy specimens and at autopsy. It is thought to occur due to a developmental mesenchymal defect retarding capsule formation, causing parenchymal mixing and failure of fat cell differentiation, which allows for no physical separation of the adrenal gland and adjacent kidney [4]. The radiologic appearance on CT of an adrenal adenoma arising in a case of adrenal–renal fusion has been described in a prior case report [5]. To our knowledge, this is the first case report to describe the MRI appearance of an adrenal adenoma with adrenal–renal fusion.

Adrenal nodules are seen on approximately 5% of abdominal CT scans in persons without known cancer or endocrine disease, and as much as 6% of persons over the age of 60 will have an adrenal adenoma [6]. Adrenal adenomas are relatively common incidental findings on cross-sectional imaging, and their appearance is well characterized on CT as having low attenuation on unenhanced images and/or rapid washout on delayed postcontrast images. On MRI the diagnosis of an adenoma can be made if there is a loss of signal intensity within an adrenal nodule on out-of-phase gradient echo images [7]. However, in the setting of adrenal–renal fusion, this relatively common incidental finding can provide a diagnostic conundrum for radiologists due to it behaving similarly to RCC regarding enhancement and washout [8].

* Corresponding author. 156 E 30th St Apt 5B, New York, NY 10016. Tel.: +1 619 820 1268.
E-mail address: Sstclair1@nshs.edu (S. St. Clair).

http://dx.doi.org/10.1016/j.clinimag.2014.12.022
0899-7071/

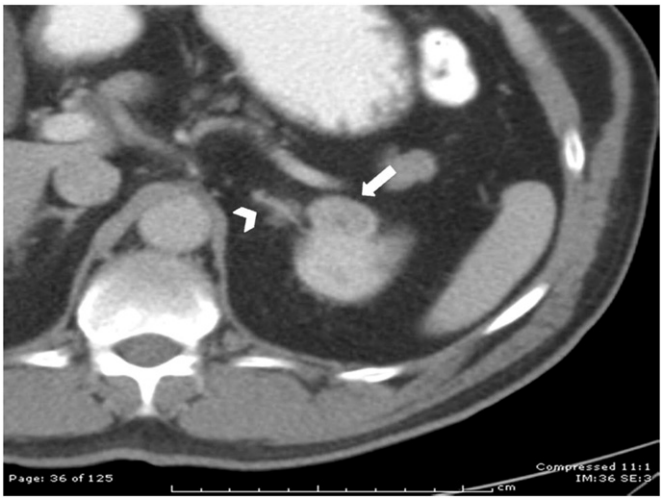

Fig. 1. Axial contrast-enhanced CT image. Heterogeneous mass projecting exophytically from the upper pole of the left kidney (arrow). The mass appears to be enhancing. The adjacent left adrenal gland (arrowhead).

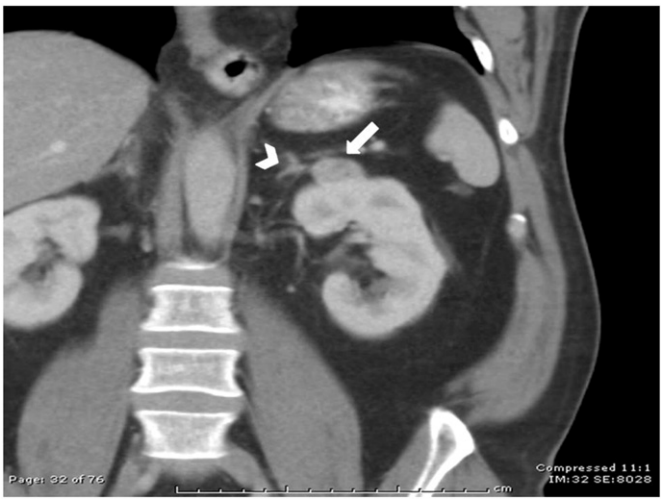

Fig. 2. Coronal contrast-enhanced CT image. Heterogeneous mass projecting exophytically from the upper pole of the left kidney (arrow). The mass appears to be enhancing. The adjacent left adrenal gland (arrowhead).

Differentiating an adrenal adenoma from a renal carcinoma usually does not pose a diagnostic problem for pathologists. However, there has been recent literature suggesting that this distinction may also be challenging [9]. In the setting of image-guided biopsy, there is a small tissue sample and, therefore, loss of architectural growth patterns, requiring more reliance on immunohistochemical evaluation. However, suboptimal immunohistochemical evaluation due to overlapping immunophenotypes may still lead to diagnostic ambiguity [5].

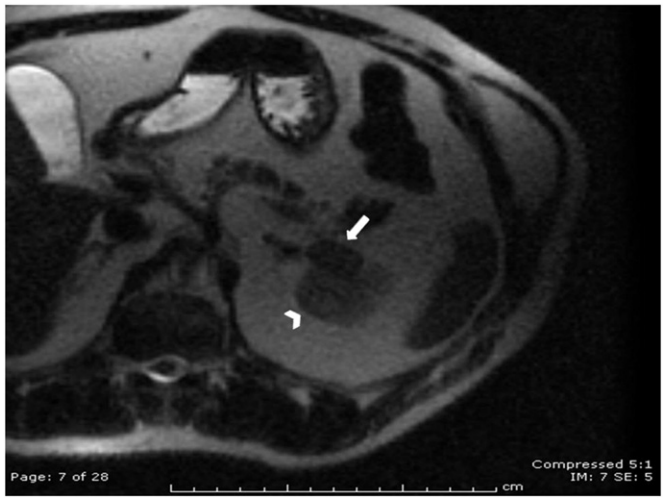

Fig. 3. Axial T2-weighted, single shot fast spin echo, MR image. The mass (arrow) is hypointense relative to the kidney (arrowhead).

Our patient had a benign lesion that ultimately did not require intervention, and yet, he underwent surgical resection. Due to the abovementioned limitations of both radiologic imaging and pathology, there has yet to be a nonsurgical solution to the diagnostic conundrum of differentiating RCC from adrenal cortical adenoma with adrenal–renal fusion. Mahadevia et al., described the appearance of this mass on CT; however, this is the first time that the characteristics of adrenal cortical adenoma with adrenal–renal fusion have been described for MRI. Although the MRI characteristics do not differentiate this lesion from potential renal malignancies either, clinicians, radiologists, and pathologists should be mindful to keep adrenal cortical adenoma with adrenal–renal fusion in their differential when a lesion of the upper pole of the kidney is incidentally seen on imaging.

References

[1] Sun MR, Ngo L, Genega EM, Atkins MB, Finn ME, Rofsky NM, et al. Renal cell carcinoma: dynamic contrast-enhanced MR imaging for differentiation of tumor subtypes – correlation with pathologic findings. Radiology 2009;250(3):793–802.
[2] Pedrosa I, Chou MT, NGO L, H Baroni R, Genega EM, Galaburada L, et al. MR classification of renal masses with pathologic correlation. Eur Radiol 2008;18(2):365–75.
[3] Rokitansky K. *A manual of Pathological Anatomy*, Vol. Part II. Philadelphia: Blanchard; 1855[188 pp.].
[4] Honore LH, O'Hara KE. Combined adrenorenal fusion and adrenohepatic adhesion: a case report with review of the literature and discussion of pathogenesis. J Urol 1976;115(3):323–5.
[5] Mahadevia S, Rozenbilt A, Milikow D, Marinovich A. Renal-adrenal fusion: instance of an adrenal adenoma mimicking a solid renal mass at CT—case report. Radiology 2009;251(3):808–12.
[6] Blake MA, Cronin CG, Boland GW. Adrenal imaging. AJR Am J Roentgenol 2010; 194(6):1450–60.
[7] Taffel M, Haji-Momenian S, Nikolaidis P, Miller FH. Adrenal imaging: a comprehensive review. Radiol Clin North Am 2012;50(2):219–43.
[8] Ye H, Yoon GS, Epstein JI. Intrarenal ectopic adrenal tissue and renal-adrenal fusion: a report of nine cases. Mod Pathol 2009;22(2):175–81.
[9] Sangio AR, Fujiwara M, West RB, Montgomery KD, Bonvetre JV, Higgins JP, et al. Immunohistochemical distinction of primary adrenal cortical lesions from metastatic clear cell renal cell carcinoma: a study of 248 cases. Am J Surg Pathol 2011;35(5):678–86.