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Case Report

Giant Nonfunctioning Carcinoma of the Adrenal Cortex Mimicking Renal Cell Carcinoma: A Diagnostic Dilemma

Azhar A. Khan, Iqbal S. Shergill, Rizwan Hamid, and Sandeep S. Gujral

Adrenocortical carcinoma is a rare, highly malignant neoplasm that originates in the adrenal cortex and is difficult to differentiate from renal cell carcinoma, especially if it is gigantic and nonfunctional. We report the case of a 40-year-old man with an incidental mass in the right upper abdomen. Magnetic resonance imaging revealed that the mass originated from the right kidney and was highly suggestive of renal cell carcinoma. However, histologic examination after radical nephrectomy confirmed the mass to be an adrenocortical carcinoma compressing the kidney. We discuss the obscurity and implications of such a diagnosis. UROLOGY xx: xxx, xxxx. © 2007 Elsevier Inc.

Adrenocortical carcinoma is a rare malignant growth, affecting only 1 or 2 persons per 1 million population, which originates in the cortex of the adrenal gland.[1] They are generally found at an advanced stage and are usually associated with poor prognosis, especially when they are nonfunctioning. We herein describe the case of a giant adrenocortical carcinoma that was diagnosed as renal cell carcinoma (RCC) preoperatively and review the literature to describe the difficulties in reaching a preoperative diagnosis in such cases.

CASE REPORT

A 40-year-old man was incidentally found to have a large mass in the right upper abdomen. Magnetic resonance imaging (MRI) revealed the mass as originating from the right kidney (Fig. 1). It was highly suggestive of renal cell carcinoma (RCC). The case was further discussed in a multidisciplinary team meeting comprising urologists, radiologists, and oncologists. Initial diagnosis made by the radiologist was maintained. There was no associated lymphadenopathy or distant metastases. The patient underwent a right radical nephrectomy, which showed a 30 × 25 × 25-cm mass (Fig. 2). Preoperatively it seemed to originate from the kidney, and no distinction could be made with the adrenal gland. However, histologic examination confirmed the mass to be an adrenocortical carcinoma compressing the kidney, which had undergone complete atrophy.

The patient made a smooth postoperative recovery. He was reviewed in light of histopathologic diagnosis. He did not show any clinical signs of adrenocortical disease. His urinary and biochemical profile related to the adrenal gland was within the normal range. He remains asymptomatic 16 months after operation.

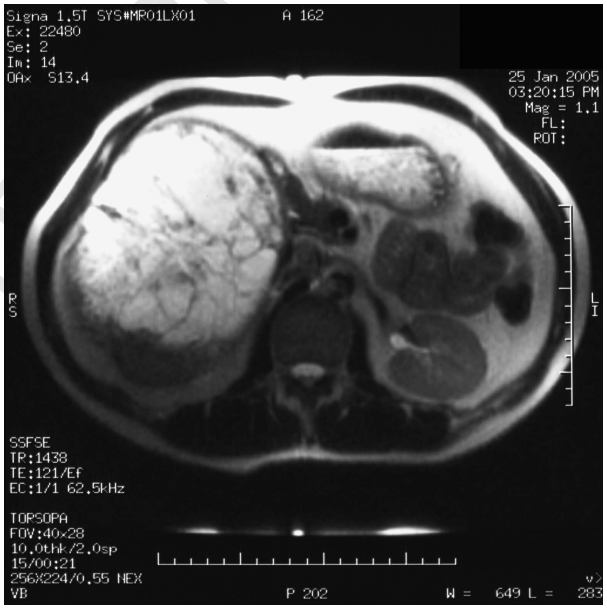

Figure 1. Magnetic resonance imaging shows a mass arising from the right kidney and occupying the right upper abdomen.

COMMENT

Adrenocortical carcinomas are rare cancers occurring in the endocrine tissue of the adrenals. Approximately 80% of adrenal tumors are functional.[2] Functional tumors are more common in children and young women, whereas nonfunctional tumors occur more frequently in older patients.[3] It is uncertain whether nonfunctional tumors are truly so or whether the metabolites are so low that they neither cause physiologic change nor can be picked

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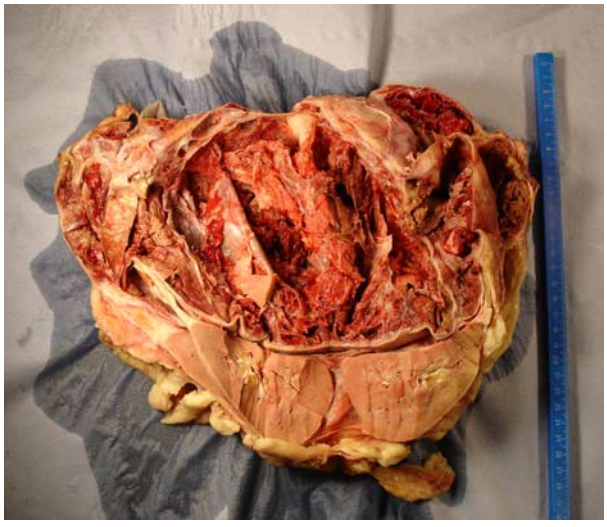

Figure 2. Mass after radical nephrectomy.

up by the available assays. Computerized tomography (CT) or MRI are used for diagnostic purposes. In small (3 to 6-cm) lesions fine-needle biopsy can be performed. If the aspirate is diagnostic then up to 95% of adrenal lesions can be accurately diagnosed.[4]

Fimmano *et al.*[5] reported a similar case of a large nonfunctioning adrenal carcinoma with a 24 × 18-cm mass. Their patient had a preoperative fine-needle biopsy suggestive of RCC without any clinical signs of adrenal disease. However, preoperatively the mass seemed to be of adrenal origin and was distinct from the kidney, which was preserved. Kunieda *et al.*[6] reported a patient in whom a giant adrenocortical carcinoma was found to have recurred in the contralateral adrenal gland and intrapelvic cavity 6 years after his initial operation. They also concluded that larger tumors are linked with better prognosis because aggressive tumors give rise to distant metastases and therefore become symptomatic at an early stage.

Computerized tomography or MRI can be used for diagnosis of RCC. The radiologic diagnosis has a sensitivity of more than 90%. A fine-needle aspiration biopsy is not recommended because this has a high false-negative rate.[7] Selective angiography and adrenal venography can distinguish tumors of the adrenal gland from tumors of the upper pole of the kidney.

It is obviously important to differentiate between adrenal and renal tumors preoperatively. Although radical surgical excision can be curative for patients with localized malignancies, only 30% of these malignancies are confined to the adrenal gland at the time of diagnosis.[8] If the diagnosis is known before surgery, CT and/or MRI of the abdomen can provide useful information about local invasion or spread to the kidney. Positron emission tomography may be effective in identifying unsuspected sites of metastases.[9] Even in the presence of a giant adrenocortical carcinoma, involvement of the kidney can be assessed during the operation, and attempts can be made to preserve the kidney.[5]

However, this differential from kidney tumors might not always be possible. To our knowledge, there is no reported case of RCC greater than 20 cm. Hence, we believe a high index of suspicion should be maintained in tumors larger than 20 cm to make a correct diagnosis, to either save the kidney or be prepared to deal with adrenal pathology both preoperatively and postoperatively.

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AQ2— Please check figure legends.

AQ3— New reference 6 added for Kunieda et al, per search of PubMed. OK as added?