

## Renal Adenocarcinoma in an Asymptomatic 19-Year-Old Female

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**Abstract.** Renal adenocarcinoma is rare before age 20. Clinically and radiographically, it presents similarly in adults and children. Prognosis is related to the clinical stage of the tumor at surgery. Treatment methods are still under investigation.

**Key words:** Kidney, malignant neoplasm – Primary adenocarcinoma – Selective renal angiography – Renal ultrasonography – Renal neoplasm, calcification

Renal adenocarcinoma is rare in children and adolescents [1, 2], but it is the most common renal neoplasm between ages 10 and 20 [3], and it is much more common than Wilms' tumor in this age group [4]. It may present as an abdominal mass rather than in the flank [5, 6], and calcification may be more common in younger patients [7], but the sonographic and radiographic findings as well as prognosis and treatment are similar in all age groups. This case shows that adenocarcinoma belongs in the differential diagnosis of any renal mass, regardless of the patient's age.

### Case Report

A 19 year-old female had a 5 cm firm, nontender, right upper quadrant mass on routine physical examination. There were no systemic signs or symptoms, and all laboratory examinations were normal. Gray scale ultrasonography showed a sharply circumscribed 6 × 5 × 6 cm anterior right lower pole renal mass. The mass was hypoechoic, with multiple low-level echoes and acoustic enhancement (Fig. 1). Excretory urography with tomography showed a smooth, sharply marginated mass without displacement of the collecting system. The medial and inferior walls contained a thin rim of calcium (Fig. 2). There was no opacification of the mass, and the contours were sharply marginated (Fig. 3). There was neo-

vascularity at the parenchyma-mass interface, but the mass was otherwise avascular despite epinephrine infusion (Fig. 4). The renal vein was not invaded, and there were no liver metastases on celiac angiography. The left kidney was normal.

Right radical nephrectomy was performed. Pathologic examination showed a necrotic clear cell carcinoma arising from the lower pole of the kidney, bounded by a fibrous pseudocapsule, without lymphatic or vascular invasion (Fig. 5). No postoperative chemotherapy or radiotherapy was given. There was no evidence of recurrence a year later.

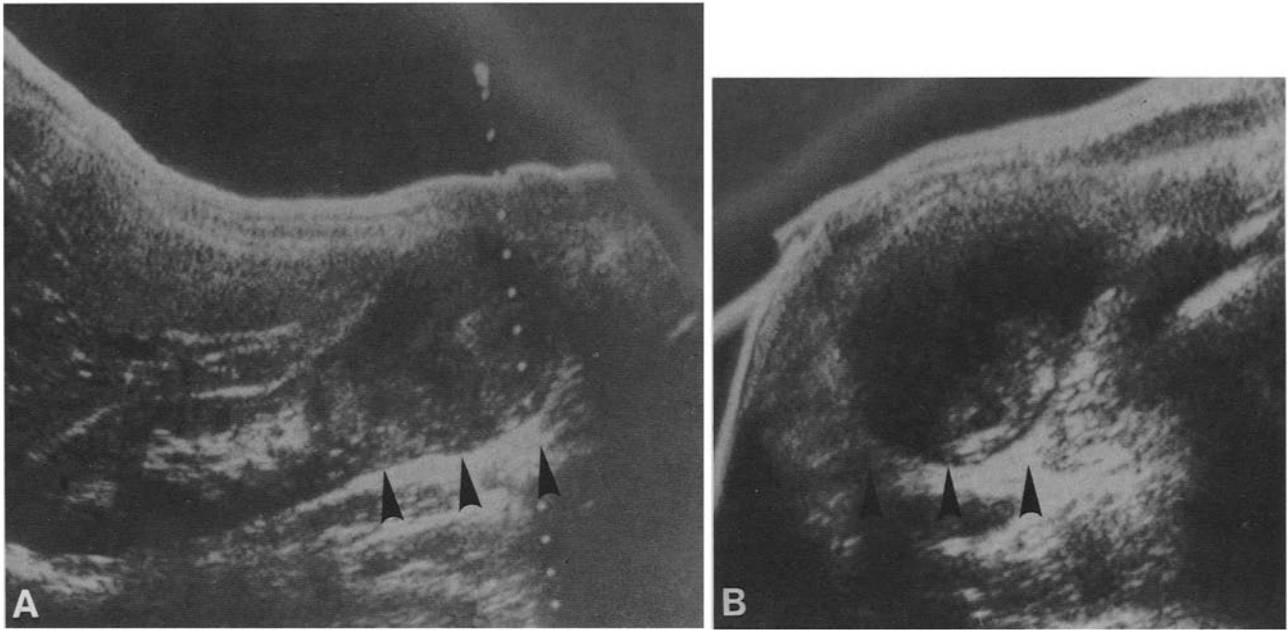
### Discussion

Manson et al. [5] reviewed 36 childhood renal adenocarcinomas and compared them with those of 476 adults [6]. Of the younger patients, 70% presented with palpable masses, usually abdominal. Fewer adults presented with masses, most commonly in the flank. Manson et al. suggested that these differences could be related to the relative ease of abdominal palpation in children. In 31% of the children and adolescents abdominal or flank pain was reported. About the same number of adult patients had pain, usually in the flank rather than the abdomen. Gross hematuria occurred in about 44% of both groups. The classic triad of palpable mass, gross hematuria, and pain was found in 5% of younger patients and 10% of adults. About 40% of the patients in each group had constitutional symptoms such as weakness, nausea, vomiting, and weight loss. A significant difference between the 2 groups was that adults had more frequent renal vein involvement [5, 8].

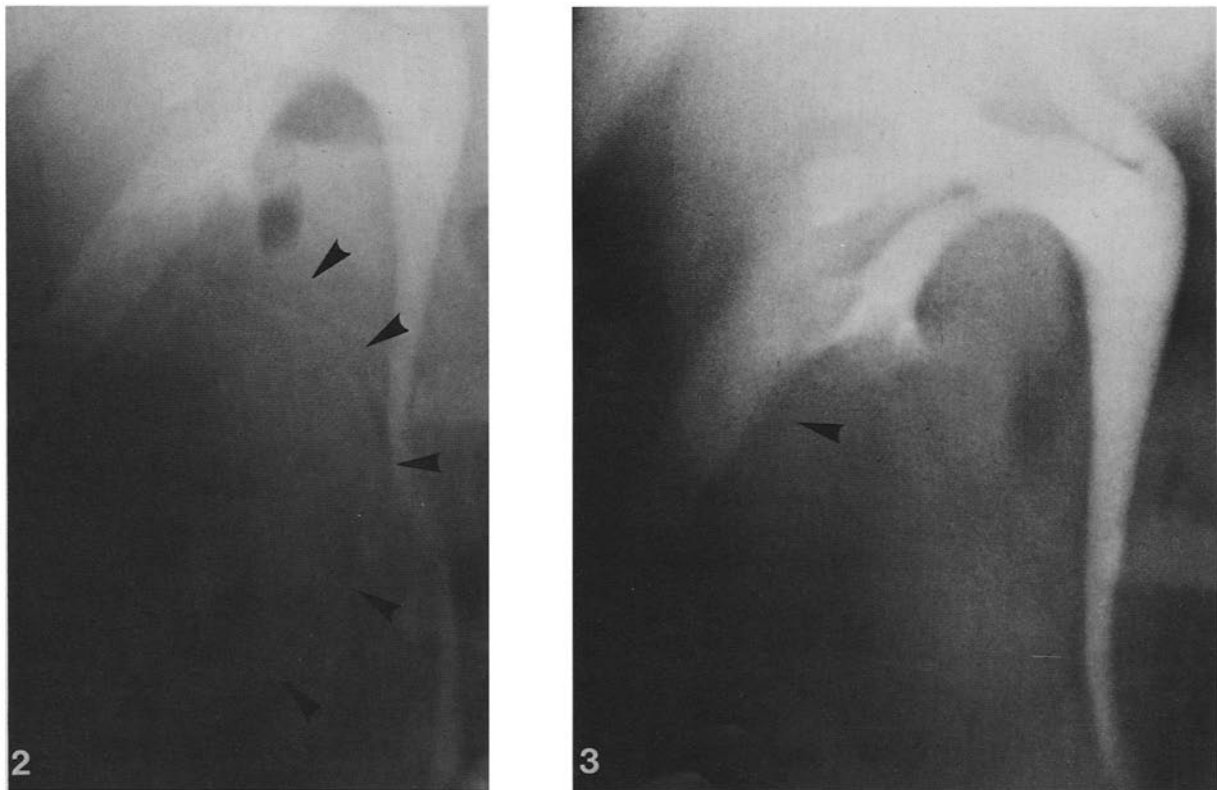
Our patient's presentation was unusual, not only for her age but also because she had a painless right upper quadrant mass without any other clinical or laboratory findings.

The tumor contained a thin peripheral rim of calcium, as did 24% of cases reviewed by Castellanos et al. [7]. This is slightly greater than the 10–20% calcification rate found in adult adenocarcinoma by

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**Fig. 1.** **A** Longitudinal and **B** transverse ultrasonograms showing a large hypoechoic mass containing multiple low-level echoes arising from the inferior pole of the right kidney. Notice acoustic enhancement (*arrowheads*)



**Fig. 2.** Excretory urogram showing a smooth, sharply marginated mass in the lower pole of the right kidney with no displacement of the collecting system. There is a thin rim of calcium in the medial and inferior walls (*arrowheads*)

**Fig. 3.** Nephrotomogram showing nonopacification of the mass. The outer margin is less than 1 mm thick, and the angle between the outer margin and normal renal parenchyma is acute, the so-called claw sign suggesting benign tumor (*arrowheads*)

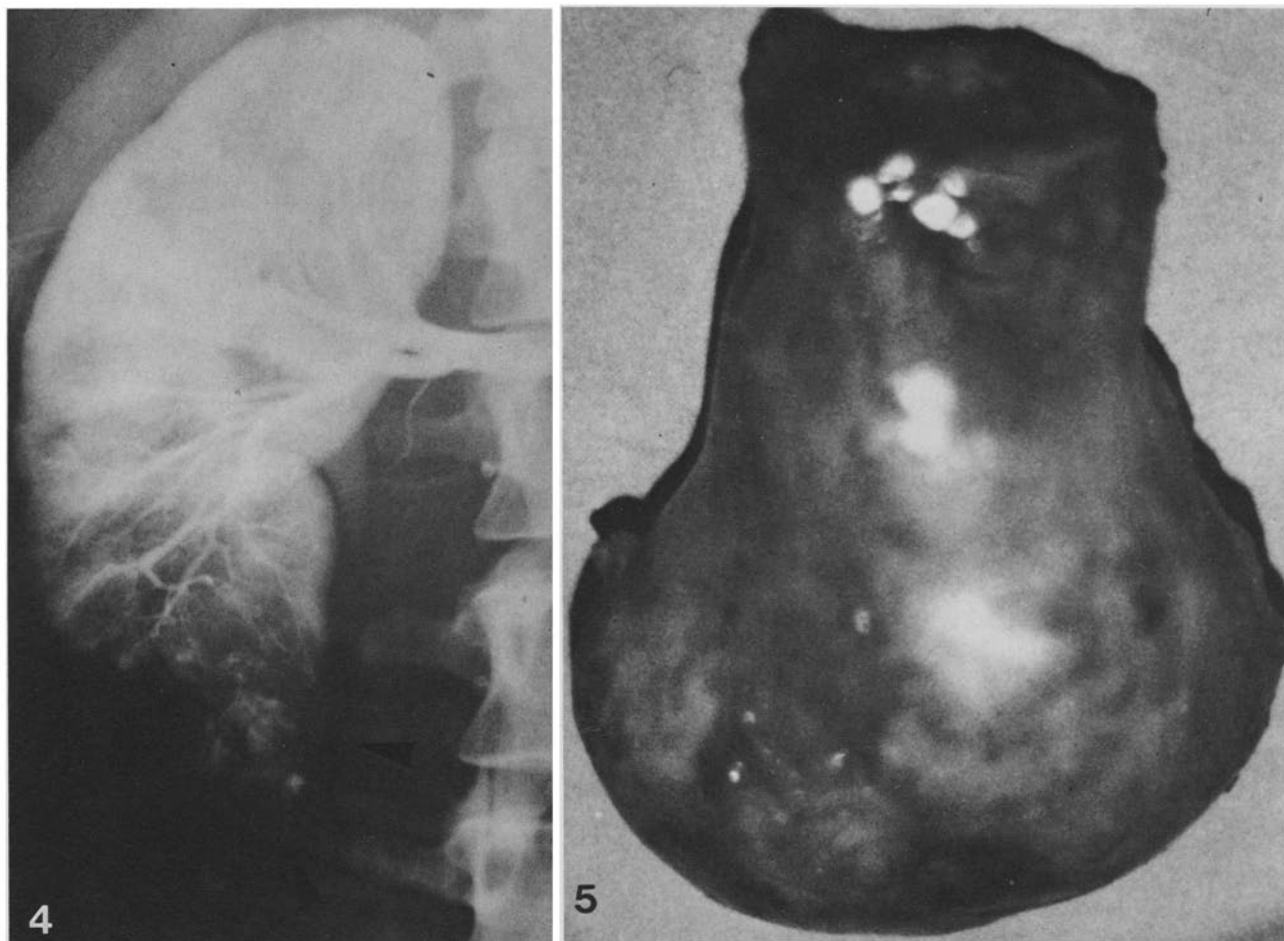


Fig. 4. Right renal arteriogram showing neovascularity at the interface between the mass and normal renal parenchyma (arrows)

Fig. 5. Gross specimen of the lower half of the right kidney showing a smooth, encapsulated mass arising from the lower pole

Daniel et al. [9], who suggested that calcification restricted to the periphery was more commonly associated with benign lesions. However, Sniderman et al. [10] concluded that any calcified renal lesion must be regarded as potentially malignant.

Most renal masses displace the collecting system on excretory urography, but our patient's tumor was exophytic, and the calices were normal. Nephrotomography differentiates cyst from tumor 95% of the time [11], but it was not diagnostic in our case. Malignant tumors frequently opacify, but necrosis was complete in our case, and none of the tissue within the mass opacified. Although most necrotic tumors have thick walls and an irregular tumor-parenchymal interface, in this case the wall was thin and tumor-parenchymal interface was smooth. Also, the junction between normally opacified renal parenchyma and the radiolucent mass was sharp, suggesting a benign cyst, but this can be seen in any encapsulated, avascular expanding renal mass [12].

On ultrasonography, the tumor appeared predominantly cystic, with marked acoustic enhancement. The multiple low-level echoes within the mass suggested tissue necrosis, but these findings may also be seen in abscesses and resolving hematomas. The final diagnosis required angiography.

Hypernephromas are hypervascular in 90–95% of cases. In our case, there were tumor vessels at the interface between the mass and normal renal parenchyma. The mass was otherwise avascular despite epinephrine enhancement. The angiogram correlated with sonography and explained the cystic appearance of the mass on nephrotomography.

The tumor was locally invasive without lymphatic or vascular involvement (clinical stage IIA according to the Renal Cell Carcinoma Cooperative Group). In Castellanos' series, stage IIA had a 5 year survival of 80%. Although Dehner et al. [14] suggested that prognosis in children was related to the duration of symptoms, tumor histology, and pseudocapsule for-

mation, Castellanos et al. concluded that only the clinical stage of the tumor at surgery affected prognosis. Palpable mass, tumor calcification, location of the tumor within the kidney, and the side affected did not influence survival. There was no increased survival from radical instead of simple nephrectomy, and there was no certain benefit from radiotherapy or chemotherapy [7].

*Acknowledgements.* The authors thank Ethan Braunstein, M.D., Karen J. Travers, R.T., Augustine Colella, M.D., and Irene A. Finlay for their help.

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