Renal Cell Carcinoma:
Screening, Diagnosis, and Prognosis

Laura S. Wood, RN, MSN, OCN®

Kidney cancer is most often diagnosed incidentally at the time of radiographic imaging for other complaints. Although numerous improvements and greater use of screening measures have occurred in the setting of renal cell carcinoma (RCC), screening for this disease is usually only carried out for patients who have been identified as having one of the known genetic lineages linked with specific RCC subtypes. This article reviews key concepts in the screening, diagnosis, and prognosis of patients with RCC.

More than 57,000 people in the United States will be diagnosed with renal cell carcinoma (RCC) in 2009, with slightly more than 12,000 deaths occurring (Jemal et al., 2009). The clinical presentation of RCC may vary greatly. The kidneys are located within the retroperitoneum, surrounded by the body wall (see Figure 1). Tumor growth to large size with local extension may occur in the absence of symptoms. Less than 10% of patients present with the classic symptoms of kidney cancer—palpable mass, flank pain, and hematuria—which confer a poor prognosis (Zwiezig, 2002). Patients also may present with symptoms from systemic metastases (e.g., bone pain) or paraneoplastic syndromes (Moldawer & Figlin, 2008; National Comprehensive Cancer Network [NCCN], 2009). The latter may include hypercalcemia, erythrocytosis, cachexia, and fatigue. These syndromes are caused by dysregulated secretion of hormones or inflammatory mediators by the tumor. In these settings, the cancer may present in obscure ways, often mimicking other medical disorders such as hypercalcemia, erythrocytosis, cachexia, and fatigue. The five-year survival rates have been reported as 75%–95% for organ-confined disease, 65%–80% for perinephral fat or adrenal involvement, 40%–60% for vena cava thrombus, 10%–20% for lymph node involvement, and up to 5% for patients who develop metastatic disease following radical nephrectomy (Canda & Kirkali, 2006). The five-year survival rate for patients with metastatic RCC is less than 10% (Escudier et al., 2007). No systemic therapy has been proven to reduce the likelihood of relapse, which occurs most commonly in the lungs, bone, and brain (NCCN).

Diagnostic Methods

The initial evaluation of a patient with RCC should include a thorough history and physical examination, as well as routine laboratory tests (e.g., comprehensive metabolic profile, complete blood count) (NCCN, 2009; Nelson, Evans, & Lara, 2007).

At a Glance

✦ Kidney cancer includes several distinct morphologic characteristics and histologic subtypes that guide surgical intervention and systemic treatment planning.

✦ Most kidney cancers are diagnosed incidentally at the time of diagnostic imaging for unrelated complaints.

✦ Imaging modalities such as computed tomography, ultrasonography, and magnetic resonance imaging are essential in establishing an accurate diagnosis of renal cell carcinoma and determining the course of treatment.

Because surgical planning is dependent on disease extent, radiographic imaging plays a key role in accurately determining tumor stage, adjacent organ involvement, and metastases prior to treatment initiation (Campbell, Novick, & Bukowski, 2006).

Contrast-Enhanced Computed Tomography

RCC often is diagnosed incidentally at the time of computed tomography (CT) and ultrasonography for unrelated complaints (Volpe et al., 2003), which is fortunate as most asymptomatic tumors are small, confined, and curable (Campbell et al., 2006). CT is effective in identifying intra-abdominal metastases, regional lymphadenopathy, and venous involvement, as well as surveying the status of the contralateral kidney. However, CT offers limited accuracy in detecting lesions smaller than 2 cm (Bechtold & Zagoria, 1997) and does not show the microscopic invasion of perenephric fat. CT also is limited in the evaluation of minimally

Laura S. Wood, RN, MSN, OCN®, is a renal cancer research coordinator at the Cleveland Clinic Taussig Cancer Institute in Ohio. (Submitted May 2009. Accepted for publication August 15, 2009.)