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# Bladder, Kidney and Urologic Cancer: A Guide for Internists

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## Abstract

The kidney, ureter, and bladder cancers have different cellular ancestries and thus constitute separate clinical entities. Most frequently, tumours of the renal parenchyma are referred to as kidney cancer in general. 90% of all renal malignancies are renal cell carcinomas (RCC), which are by far the most common type of kidney cancer. Urothelial carcinoma (UC; formerly known as transitional cell carcinoma) predominates in cancers of the renal pelvis, ureter, and bladder, which are a significant cause of morbidity and mortality.

**Keywords:** Kidney cancer • Renal parenchyma • Ureter

## Introduction

Contrarily, patients with UC frequently exhibit microscopic or gross hematuria. Although UC of the upper urinary tract and bladder share a similar histology, they are treated differently and have different prognoses. To prevent local or systemic progression of these malignancies, early detection and treatment, as well as prompt referral to an experienced urologist, are essential. This article's goal is to give a general overview of the diagnosis and treatment of urinary tract cancers.

A biologically diverse group of tumours, ranging from benign lesions to aggressive cancers, are included under the umbrella term "renal mass." RCC has become more common in the US in recent years, with nearly 64,000 new cases and over 14,000 fatalities anticipated in 2017. The increased incidence of renal masses has been attributed to increased use of imaging studies, which has led to increased early-stage detection. Smoking, high blood pressure, and obesity are the main environmental risk factors for RCC. Acquired renal cystic disease also increases the risk of RCC, specifically papillary RCC, and frequently manifests in patients with end-stage renal disease. RCC typically manifests in a younger age group and can be hereditary in 3% to 5% of cases.

## Literature Review

Historically, the traditional triad of symptoms-flanking pain, hematuria, and a palpable abdominal or flank mass—was used to diagnose renal masses. Currently, only 10% or less of renal masses present with the classic triad, which frequently denotes locally advanced or metastatic disease. Instead, more than 50% of renal masses are discovered incidentally during imaging studies. The incidence of metastatic disease on initial presentation has remained between 20% and 30% across population-based studies, despite earlier detection of renal masses.

Anemia, polycythemia, hypercalcemia, constitutional symptoms (fever, weight loss, and cachexia), elevated erythrocyte sedimentation rate, or elevated C-reactive protein are just a few of the paraneoplastic conditions that can accompany RCC. Even in the absence of liver metastases, RCC may exhibit a reversible hepatitis (Stauffer syndrome), and elevated liver enzyme levels may decrease following tumour resection. Due to the wide range of potential presentations associated with these paraneoplastic syndromes, RCC has been referred to as the internist's tumour.

RCC frequently has elevated tumour neovascularity, especially in clear cell variants. Vascular endothelial growth factor (VEGF) is overexpressed and angiogenesis is increased when the tumour suppressor gene VHL is inactivated. HIF-related proteins are accumulated as a result. Mammalian target of rapamycin (mTOR) kinase, an upstream activator of HIF-1 protein expression that promotes cell growth and angiogenesis, is another significant pathway. Tyrosine kinase or mTOR inhibitors can now be used to target many of these pathways, improving the prognosis for patients with advanced RCC. Blood pressure, skin, and lymph nodes are evaluated during a physical examination of a patient with known or suspected RCC in addition to the abdomen and flanks. RCC may coexist with specific skin lesions, most prominently in hereditary syndromes. Important findings from a neurologic examination could point to metastatic disease. Lower extremity edoema may be a sign of a central venous obstruction brought on by an inferior vena caval (IVC) tumour thrombus, which is occasionally seen with locally advanced RCC.

## Discussion

When evaluating a renal mass, the role of renal mass biopsy (RMB) as a tool in the urologist's toolbox is still changing. RMB should generally only be performed if the information obtained can be used to guide clinical management and the practitioner is concerned that the mass may be hematologic, metastatic, infectious, or inflammatory in origin. Given some of the subtleties regarding the utility and performance characteristics of this procedure, early referral to a urologist for counselling about RMB and additional evaluation should be taken into consideration. An extensive overview of the primary care setting is provided by the most recent revision of the 2017 American Urological Association Guidelines for Renal Mass and Localized Renal Cancer.

The urothelium (luminal lining) of the genitourinary tract is where cancer of the renal pelvis, ureter, and bladder most frequently develops. Urothelial neoplasms that develop anywhere from the intrarenal collecting system to the distal insertion of the ureter into the bladder are referred to as upper tract UC (UTUC). The distal ureter and UC of the renal pelvis are the two most typical sites for UTUC, each accounting for 7% of all kidney tumours. In contrast to invasive UTUC, which may only be cured 40% to 50% of the time, noninvasive UTUC may be curable in up to 90% of cases. In the United States, bladder cancer is the eighth most common cause of cancer death in men and the fourth most common cancer in men. 99% of bladder cancers are caused by UC of the

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bladder, which affects men 3-4 times more frequently than women. However, because bladder symptoms in females are frequently misdiagnosed as urinary tract infections, women typically have a worse prognosis and less favourable tumour characteristics when cancer is discovered. The extent of the tumor's invasion determines the course of treatment and prognosis for UC. At the time of presentation, 75% of bladder cancer patients have disease that is limited to the mucosa or submucosa. As a result of the ureters' thin submucosal and muscular layers, UTUC typically manifests at later stages.

Only a small percentage of cases of UC have known genetic causes, making it the model for an environmental cancer. The most frequent risk factor for the emergence of UC, which is thought to be brought on by the urinary secretion of aromatic amines and their metabolites, is tobacco use. Smoking, in a dose-dependent manner, raises the risk of developing cancer in the bladder by a factor of 2 to 4. Chronic exposure to certain pharmaceutical, chemical, and industrial substances, such as cyclophosphamide, arsenic, phenacetin, aniline dyes, and other carcinogens, also poses a significant risk for the development of UC. The textile, asphalt, petroleum, metallurgy, rubber, dye, leather, dry cleaning, and painting industries are typically where these environmental exposures occur.

Abdominal, pelvic, genital, and rectal examinations should be given particular attention during a general physical examination. For information on bladder cancer clinical staging, a bimanual examination should be conducted. Men should also undergo digital rectal examinations to check for concurrent prostate cancer. To check for potential metastatic disease, lymph nodes in the supraclavicular, axillary, and groyne areas should be examined. Because many UC patients will not have abnormal physical findings, a negative physical examination should not rule out further testing. Abdominal, pelvic, genital, and rectal examinations should be given particular attention during a general physical examination. For information on bladder cancer clinical staging, a bimanual examination should be conducted. Men should also undergo digital rectal examinations to check for concurrent prostate cancer [1-6]. To check for potential metastatic disease, lymph nodes in the supraclavicular, axillary, and groyne areas should be examined. Because many UC patients will not have abnormal physical findings, a negative physical examination should not rule out further testing.

## Conclusion

An early surgical intervention can cure kidney cancer, which is more frequently found by accident. When possible, it's crucial to maintain renal function. The tumour biology of renal masses exhibits significant heterogeneity, ranging from benign to highly aggressive, emphasising the need for risk stratification and appropriate management. Although most patients with advanced and metastatic disease are incurable, there are a few rare exceptions, newer targeted drug therapies are now available and can prolong survival in these cases. Hematuria is one of the symptoms that UC frequently exhibits. The likelihood of local progression and recurrence is very high. The best chance of recovery comes from early intervention, which combines surgery and selective chemotherapy, though lifelong monitoring is required. Additionally, novel immunotherapy regimens are being created to treat advanced UC; however, the prognosis for patients with advanced and metastatic disease is poor. For both of these cancers, more recent checkpoint inhibitors are beginning to improve the management of patients with advanced disease. To facilitate early intervention and improve treatment outcomes, doctors should prioritise prompt referral to a urologist and have a high index of suspicion for RCC and UC.

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## Conflict of interest

None.

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