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SHORT COMMUNICATION

Current trends in renal cell carcinoma

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Abstract

Kidney cancer is one of the most lethal urological malignancies and surgery was the only treatment of modality a decade ago. Open radical nephrectomy was the procedure of choice for long time for all malignant masses. The increase use of imaging modalities has led to diagnose small renal masses and most of the tumors are incidentally detected now a day [1]. Depending on tumor size, age and associated co-morbidities, various management options has evolved like AS, minimal invasive ablation, nephron sparing surgery, laparoscopic and robotic nephrectomy. Role of renal biopsy has become proven in many circumstances. Targeted systemic chemotherapy has shown improved progression free survival in metastatic RCC.

Keywords: RCC-Renal cell carcinoma, Radical nephrectomy, Partial nephrectomy, Laparoscopic nephrectomy, Robotic surgery, Chemotherapy, Renal biopsy.

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Introduction

Renal cell carcinoma (RCC) represents 2-3% of all cancers with an age-standardised rate incidence of 5.8 and mortality of 1.4 per 100,000, respectively [2]. Renal cell carcinoma is the commonest solid lesion in the kidney and accounts for approximately 90% of all kidney malignancies. Etiological factors include lifestyle factors such as smoking, obesity, and hypertension. Having a first-degree relative with kidney cancer is also associated with an increased risk of RCC (13, 14). The most effective prophylaxis is to avoid cigarette smoking and obesity. As tumors are detected more frequently using imaging techniques such as ultrasound and computed tomography (CT), the numbers of RCCs diagnosed incidentally has increased. These tumors are more often smaller and at a lower stage.

Diagnosis

Many renal masses remain asymptomatic until the late stages of the disease. Currently, more than 50%

of RCCs are detected incidentally when non-invasive imaging is used to investigate a variety of nonspecific symptoms and other abdominal diseases. The classic triad of flank pain, gross hematuria, and palpable abdominal mass is now rare (6-10%) and correlates with aggressive histology and advanced disease. Paraneoplastic syndromes are found in approximately 30% of patients with symptomatic RCCs. A few symptomatic patients present with symptoms caused by metastatic disease, such as bone pain or persistent cough.

Radiological and other investigations of RCC

Radiological investigations of RCC include CT imaging, before and after intravenous contrast to verify the diagnosis and provide information on the function and morphology of the contralateral kidney and assess tumor extension, lymphadenopathy, adrenal involvement and venous involvement. MRI can be used in patient with possible venous involvement, or allergy to intravenous contrast. Chest CT Scan is most accurate for chest staging.

Percutaneous renal tumor biopsy

Renal biopsies have role in specific circumstances. 1) for histological diagnosis of radiologically indeterminate renal masses; 2) to select patients with small renal masses for surveillance approaches; 3) to obtain histology before ablative treatments; 4) to select the most suitable form of target chemotherapy in case of metastatic disease.

Primary treatment of RCC

Based on the available oncological and QoL outcomes, the current evidence suggests that localised renal cancers are best managed by nephron sparing surgery rather than by radical nephrectomy [3]. Radical nephrectomy currently recommended only for patients with localised RCC, who are not suitable for nephron-sparing surgery due to locally advanced tumor growth, when partial resection is technically not feasible due to an unfavorable localization of the tumor or local growth. If pre-operative imaging is normal, routine adrenalectomy is not indicated. Lymphadenectomy should be restricted to staging because extended lymphadenectomy does not improve survival. In patients who have RCCs with tumor thrombus and no metastatic spread, prognosis is improved after nephrectomy and complete

thrombectomy. Recommendations for primary surgical treatment of RCC according to T-stage are included in the table 1.

Table 1: Recommendations for primary surgical treatment of RCC according to T-stage.

Stage surgery	Recommendations
T1	Nephron-sparing surgery open, laparoscopic/ robot assisted [4, 5]; Radical nephrectomy - In patients not suitable for nephron-sparing surgery.
T2	Radical nephrectomy- laparoscopic recommended, open adequate and recommended, but carries a higher morbidity; Nephron-sparing surgery feasible in selected patients in experienced centers.
T3, T4	Radical nephrectomy, open recommended/ laparoscopic

Active surveillance

Elderly and co-morbid patients with incidentally detected small renal masses have a relatively low RCC-specific mortality and significant competing-cause mortality. Active surveillance is defined as the initial monitoring of tumor size by serial abdominal imaging (ultrasound, CT, or MRI) with delayed intervention reserved for those tumors that show clinical progression during follow-up.

Minimally invasive alternative treatment

Minimally invasive techniques, such as ablation with percutaneous radio-frequency, cryotherapy, microwave, and high-intensity focused US (HIFU), are suggested alternatives to surgery. Potential advantages of these techniques include reduced morbidity, outpatient therapy, and the ability to treat high-risk patients not fit for conventional surgery. These experimental treatments might be recommended for selected patients with small, incidentally found, renal cortical lesions, elderly patients, patients with a genetic predisposition to multiple tumors, patients with a solitary kidney, or patients with bilateral tumors. The oncological efficacy remains to be determined for both cryotherapy and RFA, which are the most often used minimally invasive techniques. Current data suggest that cryoablation, when performed laparoscopically, results in fewer re-treatments and improved local tumor control compared with RFA. For both

treatments, tumor recurrence rates are higher compared with nephron-sparing surgery.

Surgical treatment of metastatic RCC (mRCC)

Nephrectomy of the primary tumor is curative only if surgery can excise all tumor deposits. For most patients with mRCC, nephrectomy is palliative cytoreductive nephrectomy is recommended when possible [6]. Complete removal of metastases contributes to improved clinical prognosis. Metastasectomy should be carried out in patients with resectable disease and a good PS. It should also be considered in patients with residual and respectable metastatic lesions, who have previously responded to systemic therapy.

Recommendations for systemic therapy for mRCC

Sunitinib is recommended as first-line therapy in favorable-risk and intermediate-risk patients. Bevacizumab + IFN- α is recommended as first-line therapy in favorable-risk and intermediate-risk patients. Sorafenib is recommended as a second-line treatment for mRCC after cytokine failure. Pazopanib is recommended as first-line or after cytokine failure in favorable-risk and intermediate risk patients. Temsirolimus is recommended as first-line treatment in poor-risk patients. Everolimus is recommended as second-line treatment after failure of tyrosine kinase inhibitors. Axitinib is recommended as second-line treatment after failure of cytokines or tyrosine kinase inhibitors.

Conclusion

With advent of High quality CT scan and MRI, minimal

invasive surgical techniques, and novel systemic therapy with targeting agent RCC management has changed a lot in the past decade. Better radiological imaging modalities give accurate staging including venous/ adrenal/ lymph node involvement and helps in preoperative planning. Minimal invasive surgical techniques have become much popularized and now standard for localized disease. Active surveillance and ablative therapies are being used in management of specific population. New targeting agents have shown promising results with tolerable side effects only.

Conflict of Interest

The authors wish to express that they have no conflict of interest.

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