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Severe Dyspnea due to Pulmonary Metastasis of Renal Cell Carcinoma: Is Cytoreductive Surgery of Value?

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Key Words

Renal cell carcinoma · Pulmonary metastasis · Immunotherapy · Radical nephrectomy · Cytoreductive surgery

Abstract

Here, we present a case in which cytoreductive surgery, like left radical nephrectomy, was effective in the treatment of pulmonary metastases and para-aortic metastases from renal cell carcinoma. A 28-year-old man underwent left radical nephrectomy with pulmonary metastasectomy for the diagnosis of metastatic left renal cell carcinoma. The histologic diagnosis was clear cell carcinoma G2, pT3N1M1. He subsequently underwent i.m. administration of IFN- α , 5 million units per day for 30 days. The nasal oxygen mask was weaned gradually, and the chest tube was removable due to cessation of the continuous production of pleural fluid. The patient was well until one year after operation.

Introduction

Renal cancer is the 7th leading malignant condition among men and the 12th among women, accounting for 2.6% of all cancers [1]. A quarter of the patients present with advanced disease, including locally invasive or metastatic renal cell carcinoma (RCC), and approximately 40% of patients treated for localized RCC eventually relapse [2]. Median survival for patients with metastatic disease is about 13 months. Thus, there is a great need for more effective surgical and medical therapies.

Case Presentation

The patient was a 28-year-old man who presented with severe dyspnea to the emergency department. He was visited by a pulmonologist and admitted to the intensive care unit. On physical examination, the patient was severely cachectic, ill, but conscious. Vital signs were normal except for a respiratory rate of 26/min; his respiration was assisted with a 5-l/min nasal oxygen mask. On the chest X-ray, the field of the right lung was severely hazy and multiple small-to-medium-sized nodules were seen in the right lung. On chest CT scan, severe right pleural effusion with multiple pulmonary metastases, especially in the right side was seen. He had mild dysuria for three years, but he did not pay attention to his problem. The color of his urine did not change, and he did not have any frequency or other lower urinary tract symptoms. He had no history of addiction, smoking and alcoholism. He never had flank pain. On ultrasonography, a large solid mass in the left kidney with dimension of 133 × 111 mm was detected. On abdominopelvic CT scan, the liver had normal size and density, and no masses were seen. There was free fluid surrounding the liver, especially in the subdiaphragmatic area. The right kidney showed normal size and position, but a large inhomogeneous left renal mass was present ([fig. 1](#)). The patient underwent thoracentesis as well as pleural biopsy. The effusion was grossly bloody. Analysis of his pleural effusion showed exudative fluid with many RBCs. The pleural histologic examination was not diagnostic. After urologic consultation, the patient was scheduled for cytoreductive surgery. He underwent left radical nephrectomy with thoracoabdominal incision. The size of the kidney was 14 × 11 cm and it weighed 3,200 g. During nephrectomy metastatic lesions near the renal vein and para-aortic lymph nodes were also resected. In addition, right thoracotomy was performed by the same incision, and metastatic lesions of the right pleura were resected and sent for pathologic examinations. A right chest tube was inserted. The postoperative course was uneventful, and the patient was discharged home well on the 7th postoperative day with a fair general condition. Due to financial problems, prescription of sunitinib was not possible, and IFN- α was initiated from the third postoperative day in two 1-month courses. After the operation, follow-up CTs were performed every three months. On postoperative CT scan (9th month after operation), no remarkable finding was seen in the abdomen ([fig. 2](#)), but in the chest CT scan a hazy right lung with metastases and mild pleural effusion was seen ([fig. 3](#)). Nine months after the operation the patient was well, but he died at the beginning of the second postoperative year.

Discussion

RCCs account for 90–95% of malignant neoplasms arising from the kidney. Notable features include resistance to cytotoxic agents, infrequent responses to biologic response modifiers such as interleukin (IL)-2, and a variable clinical course for patients with metastatic disease, including anecdotal reports of spontaneous regression [1, 3]. They are classified on the basis of morphology and histology. Categories include clear cell carcinoma (60% of cases), papillary tumors (5–15%), chromophobic tumors (5–10%), oncocytomas (5–10%), and collecting or Bellini duct tumors (<1%) [1]. Response of metastatic RCC to anticancer chemotherapy or radiotherapy is poor. Surgical treatment is only performed for solitary metastasis in which the patients performance status is good [4]. The standard evaluation of patients with suspected renal cell tumors includes a CT scan of the abdomen and pelvis, chest radiograph, urine analysis, and urine cytology. If metastatic disease is suspected by chest radiograph, a CT of the chest is warranted. MRI is useful in evaluating the inferior vena cava in cases of suspected tumor involvement or invasion by thrombus. The 5-year survival rate for stage IV is 10%. Patients presenting with metastatic disease face a dismal prognosis with a median survival time of only 6–12 months and a 2-year survival rate of 10–20%. RCC is notoriously chemorefractory, and immunotherapy is associated with total response rates of less than 20% and complete response rate of less than 5%. Thus, surgery continues to play a prominent role in the management of patients with metastatic RCC. Recent randomized prospective trials suggest a survival advantage for cytoreductive surgery, and some patients with advanced

RCC may also achieve palliation. Patients with limited and resectable metastases should be considered for combined nephrectomy and metastasectomy [5]. Cytoreductive nephrectomy can extend survival by approximately 50% in many patients; it can be associated with morbidity and delay in administration of systemic therapy. Therefore, patient selection, taking into account performance status, and sites and burden of disease, which are well established prognostic factors for patients with metastatic RCC, is of paramount importance in managing this challenging group of patients [5]. For patients with metastatic renal cancer, prognostic factors defined in systemic therapy clinical trials, stratify patients into good, intermediate and poor risk groups with median survival varying from 4 to 13 months [6]. Metastasectomy performed in low-risk patients was significantly associated with enhanced survival when compared with low-risk patients not undergoing metastasectomy [6]. Two randomized, prospective clinical trials demonstrated a modest survival advantage of approximately six months for patients undergoing cytoreductive nephrectomy followed by INF- α -2b [6]. Surgery has a limited role for patients with metastatic disease. However, long-term survival may occur in patients who relapse after nephrectomy in a solitary site that can be removed. One indication for nephrectomy with metastases at initial presentation is to alleviate pain or hemorrhage of a primary tumor. Furthermore, a cytoreductive nephrectomy before systemic treatment improves survival of carefully selected patients with stage IV tumors. Metastatic RCC is highly refractory to chemotherapy and only infrequently responsive to cytokine therapy with IL-2 or IFN. IFN- and IL-2 produce regressions in 10–20% of patients, only occasionally these responses are durable. In Kanzaki et al.'s study [7] on 59 thoracotomies due to pulmonary metastasis of RCC, a median survival of 39 months (range 3–177 months) after metastatic lung resection was found. There are several reports about proper response of metastatic pulmonary metastases of RCC to radical nephrectomy and immunotherapy, IFN- α or chemotherapy [8–10].

Conclusion

Unlike other solid tumors, in the case of distant metastasis of RCC, cytoreductive surgery is of great help for alleviation of symptoms and signs of local presence of tumor and distant metastasis, especially in combination with immunotherapy. Radical nephrectomy in our young and severely symptomatic patient was of great help for alleviation of symptoms, and discharging him from the intensive care unit. Therefore, this operation is advised even in severely advanced RCC.

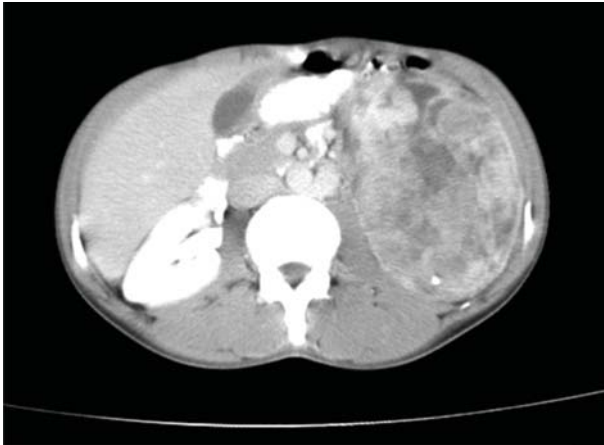


Fig. 1. Preoperative abdominal CT scan with i.v. and oral contrast: a large left inhomogeneous renal tumor is evident.

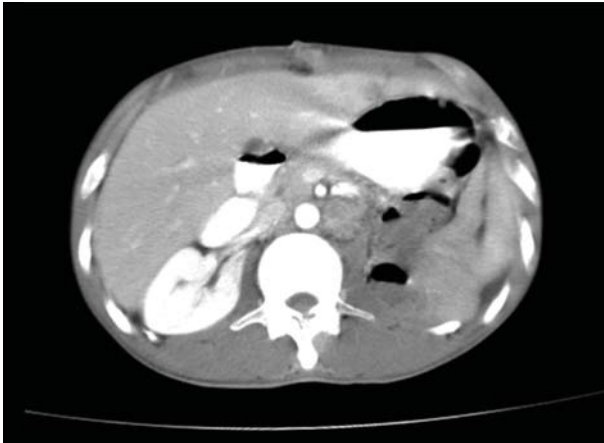


Fig. 2. One-year postoperative CT scan demonstrating nearly unremarkable findings.

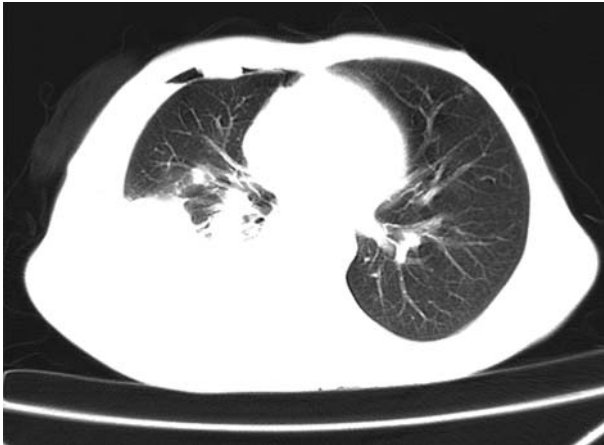


Fig. 3. One-year postoperative chest CT scan revealing tumoral involvement of the right lung and pleura.

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