

Unique Presentation of Pulmonary Metastasis Nine Years Following Resection of Primary Renal Cell Carcinoma

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Abstract

Metastatic disease after resection of localized renal cell carcinoma (RCC) is not uncommon. The lung is the most common site of metastasis from renal cell carcinoma, usually occurring within three years of primary resection. Most individuals are asymptomatic, with few patients presenting with symptoms such as chest pain or discomfort. This case is significant in that the patient had experienced symptoms of severe chest tightness over the course of six months, initially misconstrued as cardiac in origin, and eventually discovered to be due to a metastatic lung lesion eroding into the adjacent chest wall. The patient's presentation had been unique with regards to time of occurrence as well, as disease free interval (DFI) had been almost ten years. In view of this anomalous presentation and time of occurrence, the patient was subject to an extensive cardiac work-up due to suspicion of cardiac disease rather than the potential presence of a metastatic lesion, placing the patient at risk for malignant chest wall infiltration had diagnosis been delayed.

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Introduction

Renal cell carcinomas (RCC) account for approximately 80-85% of primary renal neoplasms. Metastatic disease following resection of primary RCC is not uncommon. Approximately 30% of cases are metastatic either at the time of diagnosis or during follow-up [1]. The ability of RCC to metastasize to even uncommon sites is due to its rich vasculature and lymphatic drainage [2]. The most common site of metastasis is the lungs. Most patients with pulmonary metastatic disease are asymptomatic at diagnosis [3-5]. Chest wall metastasis is rare, with only a few cases of metastasis via lymphatic or vascular pathways reported.

Disease free interval (DFI) varies, with the risk of recurrence greatest in the first two to three years following resection of RCC. The case in point exemplifies a unique presentation of pulmonary metastases potentially involving the interior chest wall, following a disease free interval of almost ten years.

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Case Presentation

A 73 year old male had repeatedly presented to primary care and cardiology clinics with complaints of chest pain and discomfort for the past six months. The patient's extensive cardiac history was significant for multiple coronary interventions, including four vessel CABG in 2006 and a recent abnormal stress test. Concern for a cardiac etiology of his symptoms prompted an extensive cardiac work-up. A dedicated CT of the chest during the patient's work-up revealed the presence of a 1.2 cm left upper lobe lung nodule. Prior to this finding, the patient had been diagnosed with primary clear cell renal cell carcinoma nine years ago, treated with resection, and had been disease free since then. Initial pathology and staging of the primary renal cell tumor was pT1b, NX, MX; Fuhrman nuclear grade 2 with negative margins. The patient's past medical history is otherwise significant for hypertension, hyperlipidemia, chronic obstructive pulmonary disease and obesity.

Cardiothoracic Surgery and Interventional Radiology were consulted leading to a PET scan and biopsy of the nodule. Biopsy was positive for clear cell type of RCC and a PET scan was otherwise negative for additional metastatic disease. Left video-assisted thoracoscopic surgery (VATS) wedge resection, pleural biopsy, and lymph node dissection was subsequently performed. During the removal of the metastatic nodule, a defect was noted in the adjacent chest wall concerning for erosion and possible metastatic spread. The mass was not adherent to the chest wall; however a defect was present in the intercostal muscles where the mass had been (see Figures 1 and 2).

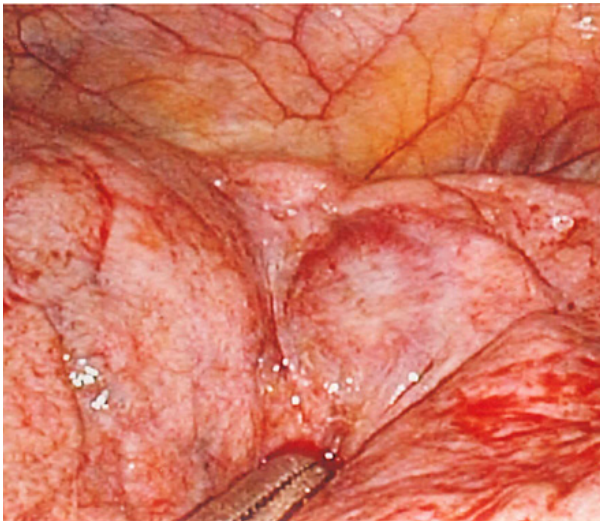


Figure 1: Image of Mass.

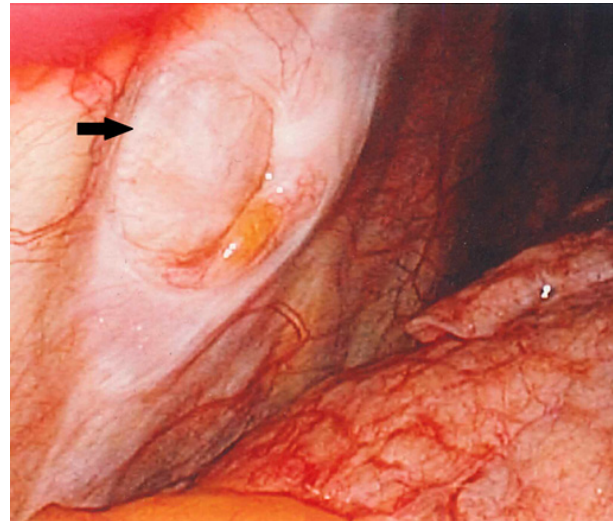


Figure 2: Image of defect in chest wall.

A decision was made to biopsy the eroded chest wall area and to perform chest wall reconstruction if the biopsy proved to be positive for metastatic disease. The area of the defect was biopsied and sent for pathology. Wedge excision was negative at the resection margin, pleural surface, and for metastatic disease to the chest wall. The patient's post-operative course was uneventful.

Discussion

RCC is known for its tendency to metastasize well after curative resection of the primary tumor. Risk of recurrence is highest in the first two to three years, with emphasis on surveillance for at least five years. Beyond five years, continuation of surveillance is based on a case-to-case basis.

As per guidelines compiled by the American Urological Association (AUA) and the National Comprehensive Cancer Network (NCCN), surveillance is comprised of history and physical examination, basic laboratory studies, and chest and abdominal imaging with either CT or radiograph. Additional imaging is based on clinical suspicion [6,7]. It has been debated that stopping surveillance after five years has been associated with missed recurrences, and that extending protocol to fifteen years post-nephrectomy would detect approximately 95% of recurrences, with an obvious undesired increase in cost as well [8]. Similar to the case in point, many reports have shown that recurrences occur well beyond the five-year mark [9], portraying the importance of maintaining a high index of suspicion in patients with a history of RCC.

Patients presenting with pulmonary metastasis are usually asymptomatic, with a few exceptions. The patient mentioned in this case presented with symptoms due to a unique presentation, in which the nodule was eroding into the adjacent chest wall. Chest pain or discomfort is a non-specific symptom with a vast differential diagnosis. Given the patient's extensive cardiac history, his chest pain was easily misconstrued as being of cardiac origin. Metastases usually involve lymphatic and vascular pathways, especially in the case of RCC, owing to the kidney's rich vascular supply. Chest wall metastasis has been described to anterior or posterior ribs; however no case has been reported involving spread to the intercostal muscles of the chest wall adjacent to the visceral pleura. As with all cancers, contiguous spread due to direct infiltration of tumor cells (such as that involved in the spread of RCC through the Gerota's fascia and into the adrenal gland) is always a possibility. The patient had a clear erosion of the chest wall, and although the metastatic nodule was not adherent to the wall, direct malignant infiltration into the chest wall was a potential possibility.

Progression free survival is an important end-point in treatment of patients with malignancy. In patients with lung metastasis, metastatectomy is a potential curative approach [10]. Good prognostic factors for pulmonary metastases include the presence of solitary metastasis as well as small number and small size (< 3 cm) of metastases. Favorable outcomes are linked to metachronous rather than synchronous metastasis, and a disease-free interval greater than three years between initial nephrectomy and subsequent diagnosis of pulmonary metastases carries a better prognosis [9,11]. The majority of these apply to the case in point.

Conclusion

Patients presenting with non-specific complaints with a history of malignancy should be assessed and investigated with a high index of suspicion, regardless of DFI. Erosion into the adjacent chest wall is a unique presentation of pulmonary metastases, which exemplifies the potential of other distinctive metastatic pathways. Regardless of the surveillance plan, it is imperative that clinicians, both specialists and internists, deal with patients with a history of malignancy using a broad approach, thus avoiding telescopic views leading to delayed diagnostic or therapeutic interventions.

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