Isolated Scar Site and Renal Bed Recurrence of Renal Cell Carcinoma: A Rare Case Report

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ABSTRACT

Renal cell carcinoma (RCC) is known for its unpredictable metastatic patterns, often presenting challenges in management. Understanding the unique recurrence patterns is crucial for improving patient outcomes. The authors report a case of a 56-year male with a history of carcinoid tumour treated by left pneumonectomy in 2015 and was found to have a large solid renal mass on screening CT. He underwent an open radical nephrectomy. He experienced an isolated renal scar site metastasis and renal fossa recurrence one year post-surgery. The metastasis presented as a painful 7 × 8 cm swelling at the surgical incision site. Imaging and biopsy confirmed metastatic RCC at both sites. He underwent local excision of the scar site metastasis and renal fossa recurrence. Although the abdominal wall mass was excised completely, dense vascular adhesions prevented the complete resection of the renal fossa mass. Histopathology confirmed metastatic RCC, with postoperative imaging revealing a residual tumour in the renal bed. Systemic therapy was recommended, and follow-up imaging every three months showed stable disease. This report highlights the rarity of simultaneously isolated recurrences at these sites and discusses the implications for surgical and systemic management, including the role of vigilant follow-up and consideration of emerging systemic therapies.

Key Words: *Scar site metastasis, Renal fossa recurrence, Renal cell carcinoma (RCC), Radical nephrectomy.*

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INTRODUCTION

Renal cell carcinoma (RCC) is a significant urological malignancy, accounting for 2-3% of all adult cancers worldwide. It is known for its varied and sometimes unpredictable metastatic behaviour, often challenging traditional expectations of recurrence. Common metastatic sites include the lungs, liver, bones, and lymph nodes.[1] However, RCC is unique among malignancies for its potential to recur in unusual sites, and isolated recurrences in the surgical scar[2] or renal fossa[3] are exceedingly rare. Documented cases of simultaneously isolated scar site and renal fossa recurrence are scarce, making this case noteworthy.[4] The mechanisms underlying such atypical patterns are not well understood but are believed to involve a combination of tumour seeding during surgery, haematogenous spread, or lymphatic dissemination. Factors such as tumour grade, stage, histological subtype, and surgical margin status are known to influence the recurrence risk in RCC. Notably, certain histological features, such as rhabdoid differentiation, are associated with poor prognosis and an increased likelihood of recurrence. This case report details a unique presentation of RCC with both isolated scar site metastasis and renal bed recurrence, providing insight into the unusual recurrence patterns of RCC and the challenges they pose for management.

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CASE REPORT

A 56-year male with no prior comorbidities presented with a history of a carcinoid tumour, for which he underwent a left pneumonectomy in 2015. The tumour was identified as a neuroendocrine carcinoid in the left main bronchus, measuring 3 × 2 × 1.5 cm with negative surgical margins. In 2023, on routine screening imaging, he was diagnosed with a large solid right renal mass confined to the kidney. There were no nodal or distant metastases. An unremarkable open radical nephrectomy was performed using a flank approach, and histopathology showed a clear cell RCC characterised by 15-20% rhabdoid differentiation, WHO grade 4, and staged as pT2aN0M0. There was a clear surgical margin and no evidence of tumour spillage. At three months, a CT scan showed a small lesion in the renal bed, which was too small to characterise, and an early follow-up was advised. At the six-month follow-up, he presented with a progressively enlarging, painful 7 × 8 cm swelling at the surgical incision site (Figure 1). Ultrasound-guided core biopsy of the mass revealed metastatic RCC.

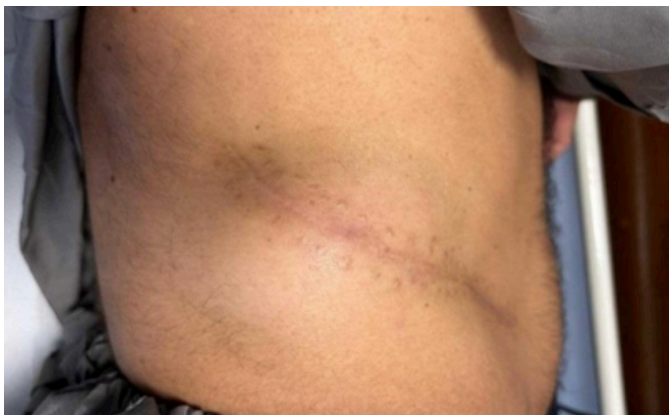

Figure 1: Pre-metastasectomy clinical image of surgical site swelling-showing a lump at the surgical site.

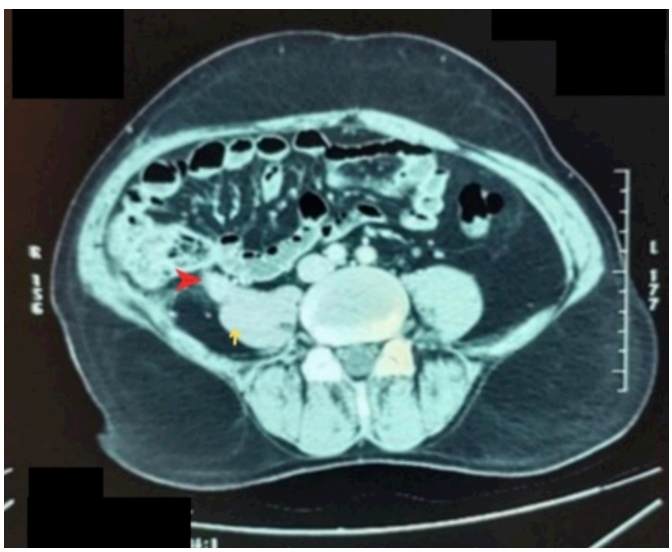

Figure 2: Pre-metastasectomy Contrast-enhanced computed tomography axial view- showing renal bed recurrence (red arrowhead). The lesion is well-defined, heterogeneously enhancing in the surgical bed abutting the right psoas muscle (yellow arrow).

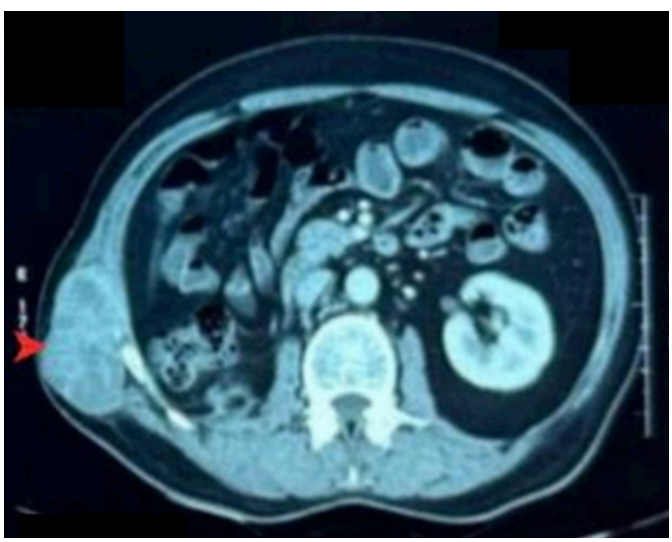

Figure 3: Pre-metastasectomy Contrast-enhanced computed tomography axial view-showing a multilobulated dermal deposit along the right abdominal wall (red arrowhead) suggestive of scar site metastasis.

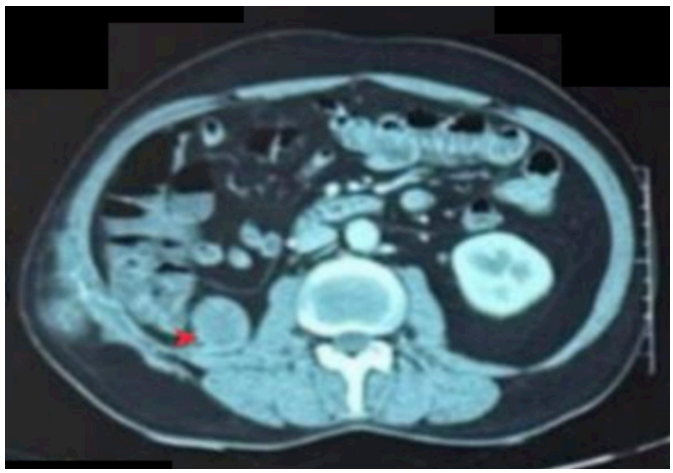

Figure 4: Post-metastasectomy Contrast-enhanced computed tomography axial view-showing a residual tumor in the renal bed (red arrowhead).

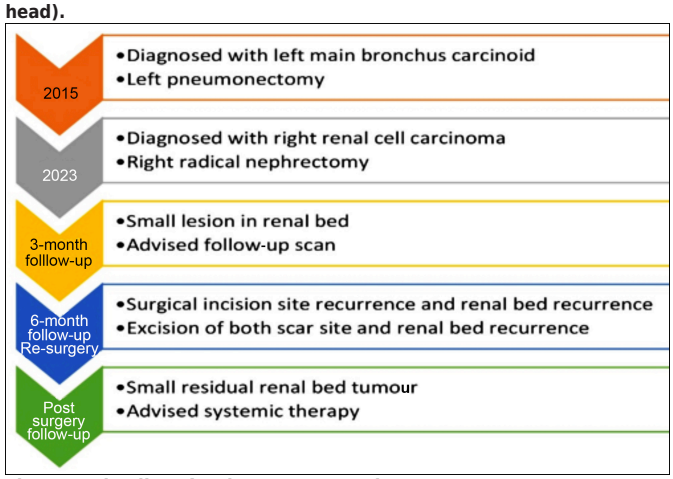

Figure 5: Timeline of patient's presentation.

Imaging revealed a small renal fossa recurrence and an isolated scar site metastasis in the subcutaneous tissue (Figure 2, 3). The case was discussed in the multidisciplinary tumour board, and given the oligometastatic nature of his disease, he was advised local treatment. He underwent local excision of both the scar site swelling and the renal fossa recurrence. Intraoperatively, the abdominal wall mass was encapsulated and excised completely; however, complete excision of renal fossa mass was not possible due to dense vascular adhesions. Histopathology confirmed metastatic RCC in the abdominal wall mass (measuring 9 × 8.5 × 7 cm) and renal bed tumour fragments (collectively measuring 10×6 cm). Immunohistochemistry showed cytokeratin AE1/AE3 positivity and PAX-8 positivity. Postoperative follow-up included contrast-enhanced CT scans every three months to monitor the residual renal bed recurrence. The initial follow-up imaging showed a stable soft tissue lesion (16 × 17 mm) adjacent to the psoas muscle without significant progression (Figure 4, 5). Given the persistence of the lesion and the inability to achieve complete resection, systemic therapy was initiated. The patient remained under close surveillance, with serial imaging demonstrating stable disease over subsequent follow-ups. No new metastatic lesions were identified, and the patient continued to be managed with regular assessments to evaluate treatment response and disease progression.

DISCUSSION

RCC is known for its diverse and unusual metastatic patterns, making it one of the most unpredictable malignancies in terms of recurrence and spread. The most common sites of metastasis for RCC include the lungs, liver, bones, and lymph nodes. However, isolated scar site metastasis, particularly in conjunction with synchronous renal bed recurrence, is an extremely rare phenomenon. Seneviratne *et al*. reported a case involving the surgical site, renal fossa, and vena caval recurrence in the same patient who had a radical nephrectomy for RCC 5 years prior, noting it was the first such instance in the literature.[4] This case is notable for presenting both scar site and renal fossa recurrences in isolation, a combination that is not widely reported in the literature.

Several mechanisms have been proposed to explain local recurrence in RCC, including tumour seeding during surgery, haematogenous spread, and lymphatic dissemination. Factors such as tumour stage, grade, histological subtype, and surgical margins play a critical role in recurrence risk. Rhabdoid differentiation (RD) is well documented as a poor prognostic indicator. Kim *et al*. assessed the prognostic value of RD in a cohort of 604 patients with N0M0 RCC and found it to be an independent risk factor for recurrence-free survival (RFS) and cancer-specific survival (CSS) and also highlighted that the short time to recurrence seen in these patients reflects the increased aggressiveness of RCC with RD, particularly in early pathological stages.[5] This aligns with our patient's clinical course, where the recurrence occurred despite clear surgical margins and no evidence of intraoperative tumour spillage, likely due to the inherent aggressiveness of the rhabdoid component.

Interestingly, while scar site metastasis has historically been associated with laparoscopic nephrectomy due to concerns about port-site seeding, recent data challenge this assumption. In recent years, the number of laparoscopic nephrectomies has increased, raising concerns about the oncological safety of this approach particularly with regard to local or port site metastasis. However, randomised studies have not shown a significant difference in the incidence of scar site metastasis between open and laparoscopic procedures, with rates ranging from 0.9 to 1.8%[6] following both conventional open and laparoscopic nephrectomies. This suggests that factors beyond surgical technique such as tumour biology may play a significant role in local recurrence, complicating the presumed association between laparoscopy and surgical site metastases.

Management of local recurrence in RCC is challenging, but the only curative option for these patients remains surgical resection, which should be attempted in those with localised disease and good functional status. As noted by Chow *et al*., solitary renal fossa recurrence after nephrectomy is a rare but important clinical entity distinct from recurrence with metastasis and can benefit significantly from surgical resection.[7] The five-year survival rate post-resection was significantly higher (62%) in patients with isolated recurrence as compared to those with metastasis 0%.[8] Systemic therapy may aid surgery in managing RCC recurrence, as noted by Tanguay *et al*.,[9] though relapse rates remain significant. Minimally invasive techniques such as cryoablation show potential for selected patients, but wide-side surgical excision with negative margins remains the gold standard.[10] This case emphasises the need to explore the role of adjuvant therapies for patients with complex recurrence patterns.

The patient's prior history of a carcinoid tumour, managed with pneumonectomy, further complicates his clinical picture. While carcinoid tumours and RCC are distinct, a history of previous malignancy can influence surveillance strategies and overall cancer risk. This case highlights the need for comprehensive follow-up in patients with multiple cancer histories and underscores the importance of considering all aspects of a patient's oncological background when evaluating recurrence risks and management strategies.

Despite achieving negative surgical margins and no evidence of tumour spillage during the initial nephrectomy, the aetiology of the recurrence remains unclear. This case highlights the complexity of RCC recurrence patterns and the need for ongoing vigilance in managing RCC patients, particularly those with aggressive features such as RD. The rarity of simultaneously isolated scar site and renal bed recurrences, particularly following open surgery, makes this case a noteworthy contribution to the understanding of RCC recurrence patterns. Interestingly, the prognosis of patients with simultaneous recurrences remains unclear, as most reported cases involve isolated recurrences. Comparing outcomes between these different recurrence patterns would be valuable in guiding management strategies.

This case of simultaneously isolated scar site and renal bed recurrences of RCC underscores the need for heightened awareness and rigorous follow-up in patients with RCC, especially those with aggressive histological features. It also emphasises the need for a comprehensive approach to cancer management, considering both the patient's oncological history and the unique patterns of recurrence. Novel systemic therapies should be considered in patients with complex recurrence patterns such as those presented in this case.

PATIENT'S CONSENT:

Written informed consent was obtained from the patient for his anonymised information to be published in this article.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

NM: Conceptualisation and writing of the manuscript.
MHA: Reviewing and proofreading of the manuscript.
Both authors approved the final version of the manuscript to be published.

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