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# Incision site metastasis following open radical nephrectomy for renal cell carcinoma: A case report

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ABSTRACT

Cancer relapsing can rarely occur at the surgical scar. It happens in laparoscopic and robotic surgery more than the traditional open surgery. It is extremely rare after urological cancer surgery. These cases are linked to a poor prognosis, so therapeutic strategies should be developed. Several factors contribute to this phenomenon, including hematogenous spread and high-grade primary tumors. Here, we report a case of a 42-year-old male who developed an incision site metastasis following open radical nephrectomy for metastatic clear cell renal carcinoma.

## 1. Introduction

Incision site metastasis (ISM) is a rare but significant complication following surgical interventions, characterized by the development of skin metastases at the site of surgical incisions. This phenomenon is most commonly observed in patients who have undergone surgical procedures for gynecological and gastrointestinal malignancies.[1] However, the occurrence of ISM following open radical nephrectomy for renal cell carcinoma is exceedingly uncommon, with reported incidences as low as 0.4 %. These metastases may manifest months to years after the initial surgery, and individuals affected by ISM typically exhibit a low survival rate.[2,3] In this case report, we describe the occurrence of incision site metastasis in a 42-year-old male who underwent an open radical nephrectomy via Kocher incision after being diagnosed with metastatic clear cell renal cell carcinoma (mccRCC), highlighting this uncommon occurrence.

## 2. Case presentation

A 42-year-old male was referred to the urology department by a GP Praxis after he had noticed a large mass in the right lower quadrant during the physical examination, and a complaint of hematuria. In our department, the patient was pale, fatigued and had a headache. He had a history of thalassemia minor and chronic heart failure. He also mentioned a recent loss of appetite and some weight loss. The clinical examination indicated a palpable mass in the right lower quadrant and lumbar region. The liver and spleen were not palpable, and there were no signs of peritonitis. A CT scan confirmed the presence of a large mass in the right kidney.

The patient underwent in our department an open right radical nephrectomy via a Kocher incision. Intraoperatively, the patient experienced bleeding related to his thalassemia, necessitating two units of blood transfusion; however, there were no other complications, and he recovered well. The histopathological examination confirmed the diagnosis (renal clear cell carcinoma Grade IV). The pathology report indicated groups of tubular and acinar structures composed of large, clear tumor cells with small, round, uniform nuclei and nucleoli. The tumor was classified as T4N1M0 and measured 16 cm, with metastases present in four lymph nodes, each up to 7 cm in diameter; however, surgical margins are free of tumor.

Follow-up contrast-enhanced computed tomography conducted one month after the surgery did not detect any metastases, and he had well recovery. Two months later, the patient returned to the clinic with worsening pain and swelling in the epigastrium. Clinical examination revealed a palpable solid mass, tender and swelling at the end of wound scar (Fig. 1). Another contrast-enhanced computed tomography scan showed a heterogeneously enhancing mass in the anterior abdominal wall, with the right kidney absent and the contralateral kidney appearing normal (Fig. 2). The patient was referred for chemotherapy;

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**Abbreviations:**

| | |
|---|---|
| ISM | Incision Site Metastasis |
| GP Praxis | General Practitioner's medical practice. |
| mccRCC | metastatic clear cell renal cell carcinoma |
| PSM | Port Site Metastasis |
| CT scan | Computed Tomography scan |

**Fig. 1.** Physical examination revealing a visible mass with swelling in the epigastrium, with the scar of the incision visible overlying the palpable mass.

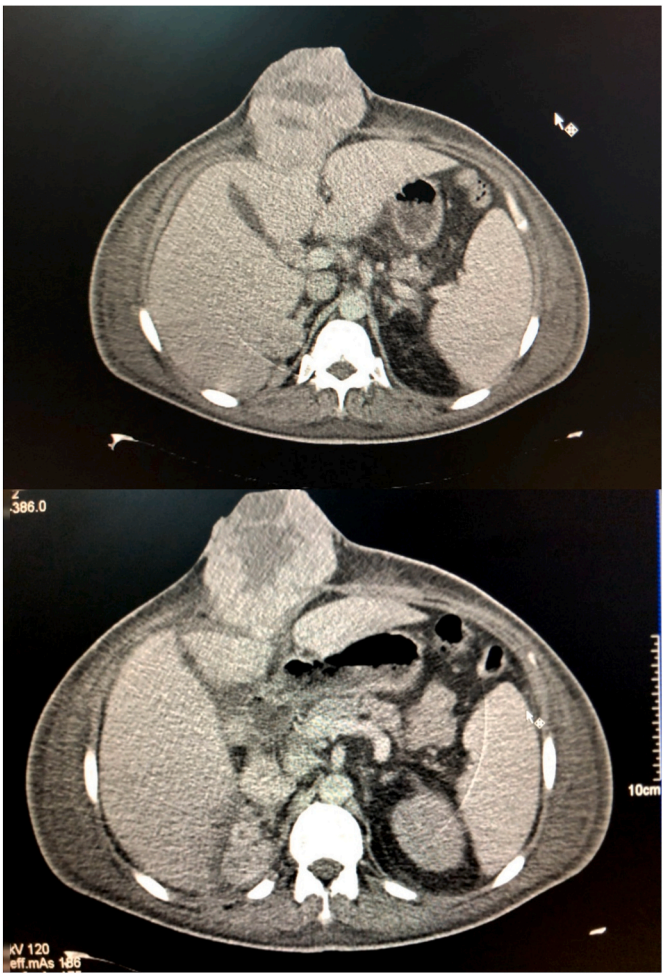


**Fig. 2.** Contrast-enhanced computed tomogram axial image displaying a heterogeneously enhancing mass in the anterior abdominal wall, with the right kidney absent and the contralateral kidney appearing normal.

however, he declined to continue the treatment due to financial limits and passed away shortly after.

## 3. Discussion

The reason behind a surgical scar metastasis has been attributed in many cases to hematogenous spread rather than an implantation from the tumor being removed.[2] It is possible that surgical procedures on the tumor and its blood supply may result in the introduction of micro-metastatic cancer cells into the circulation.[4] These cancer cells can take advantage of the wound healing mechanisms to settle in surgical scars,[1,3] whether at the primary tumor's incision site or at an unrelated surgery scar done when an unknown cancer was present at the time of the procedure.[1] Studies have found that the chance of such incidence is significantly higher the smaller the incision site is, which explains why it is more common in laparoscopic and robotic surgeries than the traditional open surgery.[1] When such incidence happens, the recurrence following tumor resection with clear margins R0 occurs locally at the incision site in about 50 % of cases, and in distant surgical scars in only 1 %–2 %.[3]

This patient required multiple blood transfusions during the surgical procedure due to thalassemia related bleeding, and such transfusions have some immunosuppressive effects. Nevertheless, several studies have not definitively linked perioperative blood transfusion to cancer recurrence.[5] Also, high-grade tumors are more likely to develop such a metastasis[1]. In this case, the patient was diagnosed with a grade IV mccRCC in the right kidney. Further risk factors include, the patient's age, obesity, chronic inflammation in the adipose tissue and the metabolic syndrome.[1] Additionally, multiple studies have found that the primary tumor can inhibit the growth of its metastases through various mechanisms, and removing it may potentially trigger a full metastasis event.[4]

In a study by Chaturvedi et al. on 136 patients who underwent radical nephrectomy, 4 of them developed port site metastasis (PSM) and only 2 cases with ISM. The recurrence occurred approximately 7–36 months post-surgery, with none of the cases showing isolated metastasis.[2] In this case, a follow-up CT scan conducted one month after the surgery confirmed no metastasis and he was in good health; however, at exactly 2 post operative months, the patient developed a metastasis at the surgical scar, confirmed by another CT scan showing multiple metastases in the abdominal lymph nodes.

Adjuvant chemotherapy following surgery plays a crucial role in affecting the development of recurrences at surgical incision scars[1]; however, depending on the case, mccRCC may not be sensitive to chemotherapy[6]. It is notable that after the evaluation of the medical profile of the patient, he did not receive adjuvant chemotherapy following the radical nephrectomy. Overall, individuals with ISM have a relatively low survival rate, with many succumbing to the illness within the first year.[3]

## 4. Conclusion

This paper addresses a significant case of ISM following open radical nephrectomy. Although such occurrences are rare, they are associated with a poor prognosis. In recent times, there has been an increase in reported cases following laparoscopic and robotic surgeries, which highlights a potential downside despite the advantages these advanced techniques offer. This complication largely occurs outside the will of the surgeon and can happen because of various reasons. Further research and understanding of the underlying mechanisms driving ISM are essential to improve patient outcomes and develop targeted therapeutic strategies in the management of this complex issue.

## Ethics approval and consent to participate

Not applicable.

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## Consent for publication

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

## Availability of data and materials

Not applicable.

## CRediT authorship contribution statement

**Ahmed Aldolly:** Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Hazem Arab:** Writing – original draft, Data curation, Writing – review & editing. **Yousef Alsaffaf:** Writing – original draft. **Gihad Allugamie:** Writing – review & editing, Supervision, Investigation.

## Declaration of competing interest

The authors declare that they have no competing interests.

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