

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

A unique presentation of renal cell transformation into renal cell carcinoma in subcutaneous fatty tissue post twenty year old healing gun-shot wound: A case report



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ARTICLE INFO

Article history:

Received 25 November 2016

Received in revised form 14 March 2017

Accepted 16 March 2017

Available online 21 March 2017

Keywords:

Renal cell carcinoma
Cutaneous transformation
Gun-shot wound
Nephrectomy
Case report

ABSTRACT

INTRODUCTION: Renal cell carcinoma (RCC) is the most common malignancy in the genitourinary tract, and is among the 10 most common cancers in both males and females.

PRESENTATION OF CASE: We report a case of a 61-year-old male who presented with a cutaneous lesion on his left back side at a site where he had undergone several surgeries – including Left nephrectomy – twenty years ago for a gun-shot wound he sustained which penetrated his abdomen.

DISCUSSION: At that time pathology reports turned out to be normal, specially left kidney pathology report which was negative for any malignancy. Twenty years later, patient presented with a clear fluctuating painless cutaneous mass of 1–2 cm on his left back side, which grew gradually over time. Histopathologically, the incisional biopsy showed trabecular & papillary clear cells with prominent vascularity and hemosiderin deposition in the stroma, consistent with a malignant Renal cell Carcinoma (RCC). Immunohistochemically, it stained positive for Vimentin, CD10, PAX-8. Labs revealed positive renal cell carcinoma antibody. CT scans, urine tests, and bone scans failed to reveal the site of the primary lesion. Furthermore, the patient reports minimal constitutional symptoms and is grossly well.

CONCLUSION: The authors have reported an interesting case of an RCC presenting in a healed gun-shot wound in a previously nephrectomized patient. To the best of authors' knowledge, such a case hasn't been reported in the literature before, with it being unique in its time course, preceding events, and absence of primary lesions.

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1. Introduction

Renal cell carcinoma (RCC) is a malignant kidney cancer of the genitourinary tract. It is the most common type of kidney cancer and among the 10 most common cancers in both males and females [1]. Men have a higher risk of developing RCC compared to women [2]. We report a rare case of an elderly male patient with renal cell carcinoma developing twenty years after nephrectomy was carried out for a gunshot wound around the same area. SCARE criteria have been applied to our work [3].

2. Presentation of case

A 61 year old single retired male, with a twenty years old surgical history of left nephrectomy, splenectomy, small bowel resection

Abbreviations: RCC, Renal cell carcinoma; ECOG, Eastern Cooperative Oncology Group.

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<http://dx.doi.org/10.1016/j.ijscr.2017.03.023>

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and distal pancreatectomy secondary to a gunshot wound, has now presented with a left lower back cutaneous lesion in the exit wound of his gunshot trauma. which was biopsied and found to be a clear cell carcinoma, consistent with a renal origin. The lesion was then excised and with pathology showing an adenocarcinoma with negative margins. Work-up including CT scans and bone scan have not revealed a primary origin, however, a look into the patient's medical and social history can help us understanding better.

In 1991, the patient was inflicted with a gunshot wound. The bullet entered his abdomen and exited from his left back side. He was brought to the emergency department in a state of hemorrhagic shock and had 4 procedures done: Splenectomy, left nephrectomy, small bowel resection and distal pancreatectomy. Three months prior to the gunshot wound, a surgery for a herniated disc on his back was performed. The patient also has a history of hypertension and hypercholesterolemia. Mr. X's past medications include Crestor, Micardis and Triamzide for his hypercholesterolemia and hypertension, respectively. He is a smoker, with a 48 pack-year history. Alcohol is occasionally consumed. There is no evidence for any allergies or drug abuse. His family history is significant for his mother (in her 60's) having colon cancer.

After almost 20 years of the gun shot trauma and subsequent surgeries, in May 2010, the patient noticed a superficial mass on his left back side. It was around 1–2 cm and fluctuated in size. The patient reported no sign of the mass being painful or pruritic. However, due to its location, it did become tender while sitting down. The patient presented to the emergency department as he did not have a family doctor. The treating surgeon performed an incisional biopsy. Histopathologically, the biopsy showed a clear cell carcinoma consistent with a renal cell carcinoma alongside vascular invasion. The histopathological diagnosis of renal cell carcinoma was further supported by immunohistochemistry where Vimentin, CD10, PAX-8 and renal cell carcinoma antibody were tested to be positive.

Using the Eastern Cooperative Oncology Group (ECOG) scale, the patient was measured to be ECOG-0. Examinations of the head and neck, axillary and insula regions yielded no adenopathy. Cardiopulmonary exams were well within normal limits. Abdominal examinations revealed a midline scar with two smaller scars on the left abdomen. The abdomen was soft, non-tender with no masses or organomegaly. The back reveals a well-healed scar on the left side with no palpable nodules or masses. There are no suspicious dermatologic lesions in the torso or upper extremities. Digital rectal exam was normal with no blood on the examining finger.

CT scans of the brain, chest, abdomen and pelvis were carried out. They showed a small enhancing lesion within the muscles of the left back, close to the area of the previous surgery, just above the rib. The lesion measured at 2.7×1.5 cm. There was a mention of a nodule on the left adrenal measuring 1 cm and an ischemic lesion in the brain. A urine test performed yielded no results for malignancy and a bone scan was negative for metastases. Patient was brought back to the OR for a complete excision of the cutaneous back lesion. Pathologically, it showed residual adenocarcinoma in the setting of reactive granulomatosis, with negative margins. The patient was also referred to a urologist who re-ordered a CT of the brain, chest, abdomen, and pelvis. On functional inquiry, the patient has no specific complaints. He denies having headache, respiratory, cardiac, GU or musculoskeletal symptoms. He does report a change in bowel habits with more frequent loose stools but denies any other GI symptoms. In terms of constitutional symptoms, the patient has noticed some fatigue recently but his appetite and weight were stable and he denied having fever or chills. PET scan was ordered to complete his staging work-up. MRI of right kidney came out normal.

3. Discussion

With relevant history of the patient, when compared to other case reports from the literature, transformation of the renal cells into renal cell carcinoma in subcutaneous fatty tissue seems novel & warrants intrigue into this particular case.

To the best of authors' knowledge, RCC originating post-nephrectomy as a result of transformation of remnant renal cells trapped & lodged in the skin around the area of a gunshot-trauma wound has never been reported before in the literature. It is of more peculiar concern since carcinoma was diagnosed two decades after nephrectomy of same side was carried out.

Renal cell carcinomas are malignant lesions, which metastasize quite rapidly and extensively. Albeit its rare occurrence [4], cutaneous manifestation is not unheard of when associated with RCC. According to one study, the most common sites for cutaneous metastases were the trunk (40%), followed by the scalp (25%) and face (8%) [5]. Another one reported a case of RCC presenting as a post-auricular lesion [6] and six years post malignant nephrectomy in the scalp area [7]. On histopathology, these cutaneous lesions follow a similar cell structure to the original tumor: clear cells that are trabecular, papillary, or both with prominent vascularity

and hemosiderin deposition in the stroma [8]. Immunohistochemistry aids in the determination of the nature of the lesion, staining positive for vimentin, keratin, and epithelial membrane antigen [8].

However, in our reported case, metastasis was ruled out, as evident by all the radiological tests the patient underwent, and the previous pathologically evident lack of primary in the specimen of nephrectomised tissue. The previous history of same side nephrectomy post-trauma and an unusual transformation of remnant renal cells 20 years later as seen in this particular case justifies our reporting of it. Moreover, the history of a gun-shot wound in the same area with several surgical procedures further warrant greater intrigue into this case. It is unique by being primary due to these transformed remnant cells in the subcutaneous tissue, which insinuates further questions pertaining to the nature of remnant cells of resected internal organs in the long run.

4. Conclusion

This case study reported renal cells trapped within the skin of a previous gunshot wound after a nephrectomy showing malignant transformation over time with the absence of a primary lesion, an unheard-of phenomenon. This might warrant further interest into the precautions and efficacy of surgical procedures pertaining to the resection of internal organs.

Conflict of interest

The authors declare having no conflicts of interest for this article.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval

None.

Consent

Written consent from the patient and attending physician has been taken.

Author contributions

Mohammed Alqahtani contributed towards writing and drafting the article.

Awadh Alqahtani contributed towards revising the article critically for important intellectual content, finalizing the version to be published.

Guarantor

DR. Awadh Alqahtani.

Acknowledgment

This project is supported by College of Medicine Research Center, Deanship of Scientific Research, King Saud University.

Appendix A: auxiliary*Core tip*

Renal Cell Carcinoma (RCC) is a malignant neoplasm with a propensity to metastasize hematogenously. Here, however, we report a rare case of lodged renal cells transformation into renal cell carcinoma in subcutaneous fatty tissue presenting with a skin mass on the back of the patient, a site where previously the patient sustained a gun-shot wound twenty years ago with subsequent surgeries, including a nephrectomy.

*Comments**Case characteristics*

This is a case of and RCC presenting as a result of malignant transformation of remnant renal cells in a site where previously the patient had sustained a gun-shot wound and had subsequently undergone several surgeries, including a nephrectomy.

Clinical diagnosis

This case is unique in its time course, the preceding events, and the unheard-of malignant transformation of seemingly non-functioning cells. It is the first to be reported in the literature.

Experiences and lessons

Although RCCs tend to metastasize to more common organs such as the lungs and bones, a subset of them present with skin manifestations. However, as we have seen with this particular case

report, metastasis was ruled out repetitively and extensively and a primary lesion was not found. We are reporting a case indicating for possible post operative or penetrative wound renal cell trapping within subcutaneous tissue with a risk of malignant transformation in the future.

Peer review

The authors have reported an interesting case of an RCC presenting in a healing gun-shot wound in a previously nephrectomized patient with no primary lesions.

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