

Simultaneous metachronous renal cell carcinoma and skeletal muscle metastasis after radical nephrectomy



Ali Safadi ^{a,*}, Muhammed Sbeih Abu Ahmad ^a, Saher Srour ^b, Sergio Schwalb ^c, Ran Katz ^a

^a Department of Urology, Ziv Medical Center, Zefat, Israel

^b Magnetic Resonance Imaging Unit, Ziv Medical Center, Zefat, Israel

^c Department of Pathology, Ziv Medical Center, Zefat, Israel

ARTICLE INFO

Article history:

Received 16 August 2017

Accepted 21 September 2017

Available online 7 October 2017

Keywords:

Renal cell carcinoma

Metastasis

Skeletal muscle

Erector spinae

Magnetic resonance imaging

Case report

A 74-year-old male with medical history of hypertension, hyperlipidemia, ischemic heart disease and benign prostatic hyperplasia. In September 2014, he underwent left radical nephrectomy owing to clear cell renal carcinoma (T1b, N_x, M_x, Fuhrman grade II). After the surgery, he was followed by annual abdomen and chest CT scan.

In January 2017, the patient presented to our hospital with painless swelling on the right side of his upper back. On physical examination, there was a nontender palpable mass with restricted mobility under the skin. US/Doppler scan showed a 5-cm hyper-vascular lesion. A non-contrast CT scan showed asymmetry of the erector spinae muscles. MRI scan revealed a lobular hyper-vascular lesion, measuring 5.6 × 4.3 × 2.4 cm in diameter, located in the right erector spinae muscle [Fig. 1]. There was no involvement of the adjacent bones. In addition, the MRI revealed an isointense lesion measuring 2.2 × 2.6 × 3.5 in size in the upper pole of the right kidney [Fig. 2]. An incisional biopsy was performed from the muscular lesion and it revealed a clear cell RCC metastasis [Fig. 3].

In May 2017, the patient underwent right partial Nephrectomy (T1a) with wide resection of the metastasis in his back. Histopathology from the right kidney revealed RCC, clear cell type, Fuhrman grade II.

Discussion

Renal cell carcinoma accounts approximately 3% of all adult tumors and about on third of cases present as metastasis either as initial presentation or late complication.³ RCC has a widespread and unpredictable metastatic potential, even after curative nephrectomy is performed.¹ About 20–30% of patients with localized tumors at the time of nephrectomy relapse after surgery and develop metastasis.⁴ RCC can metastasize to virtually any site,¹ the most common sites are lungs (50%), lymph nodes (35%), liver (30%), bones (30%) and adrenal glands (5.5%).^{2,5} Skeletal muscle metastasis is rare with a limited number of cases that have been described in the literature.^{4,5} Possibly the first case of skeletal metastasis originating from an RCC was reported in 1979 by

Introduction

Renal cell carcinoma has a widespread and unpredictable metastatic potential and it can metastasize virtually to any site,¹ even after a very long time from removal of the primary tumor.² The most common sites for RCC metastasis are lungs, lymph nodes, liver, bones and adrenal glands.^{2,5} Skeletal muscle metastasis from RCC are extremely rare accounting 0.4% of all RCC metastasis.^{1–3} A limited number of cases regarding skeletal muscle metastasis from RCC have been described in the literature.^{4,5} We report a case of a clear cell renal carcinoma metastasis to the erector spinae muscle accompanied with metachronous RCC of the right kidney, approximately two years after left radical nephrectomy due to clear cell renal carcinoma.

To our knowledge, this is the first case reported describing an RCC metastasis to the erector spinae muscle.

Abbreviations: RCC, renal cell carcinoma; CT, computed tomography; MRI, magnetic resonance imaging; PET/CT, positron emission tomography/computed tomography; US, ultrasound.

* Corresponding author. Full postal address: Majdal Shams, Golan Hight, Postal code: 12438, Mail box: 229, Israel.

E-mail address: ali.s@ziv.health.gov.il (A. Safadi).

<https://doi.org/10.1016/j.eucr.2017.09.013>

2214-4420/© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

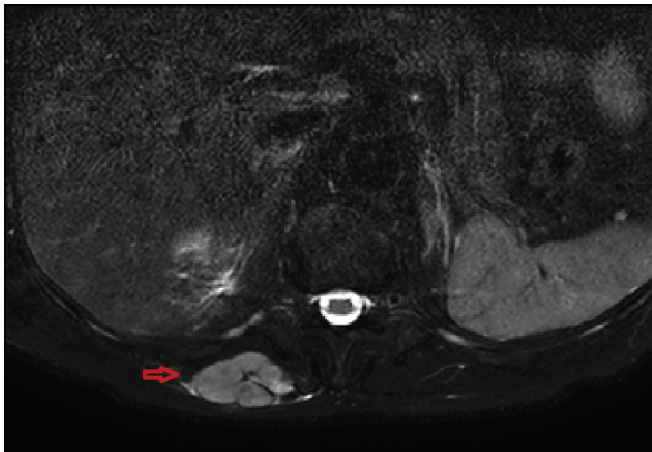


Fig. 1. Axial T2 SPAIR image showing lobular soft tissue mass (red arrow) in the right Erector Spinae muscle. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

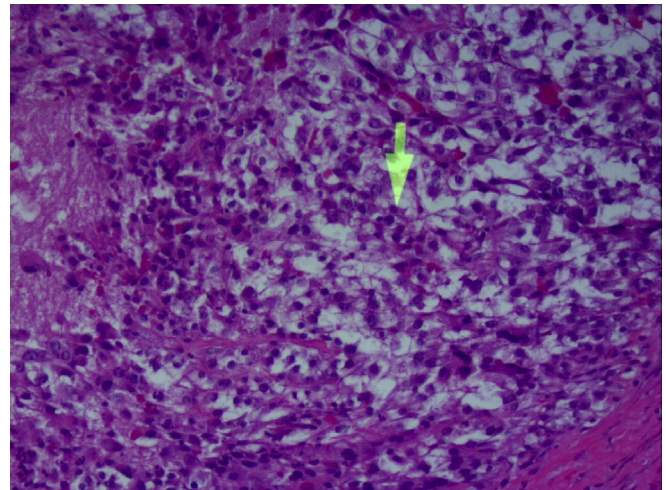


Fig. 3. Histopathologic appearance of the RCC metastasis in the right erector spinae muscle (H&E staining).

Chandler et al., describing a slowly enlarging biceps muscle mass as an atypical presentation of RCC.⁵ It has been reported that approximately 0.4% of RCC metastasizes to skeletal muscle,^{1–3} commonly as a solitary deposit developing any time between 6 months and 19 years, with the greatest risk in the first 5 years after initial presentation.³ The rarity of skeletal muscle metastasis can be explained hypothetically by the high vascularization of the muscles, production of lactic acid which suppresses tumor's angiogenesis, inhibition of metastasis by skeletal muscle-derived peptidic factor, protease inhibitors found in the extracellular matrix of the muscle and the antitumor activity of the lymphocytes and natural killers.^{3,4}

In literature, cases of metastasis of RCC to the following muscles have been described: deltoid, triceps brachii, biceps, brachioradialis, muscles of the scapula, trapezius, muscles of the abdominal wall, iliacus, iliofemoral, gluteus maximus, gluteus medius, quadriceps femoris, biceps femoris, adductor magnus and sartorius.² Metastasis to the erector spinae muscle as in our case has never been described.

Making a diagnosis of metastatic RCC to the skeletal muscle is challenging, because the site is unpredictable, the tumors may be painless, they may go unnoticed when they are small,¹ and can remain asymptomatic for a long time and usually detected only

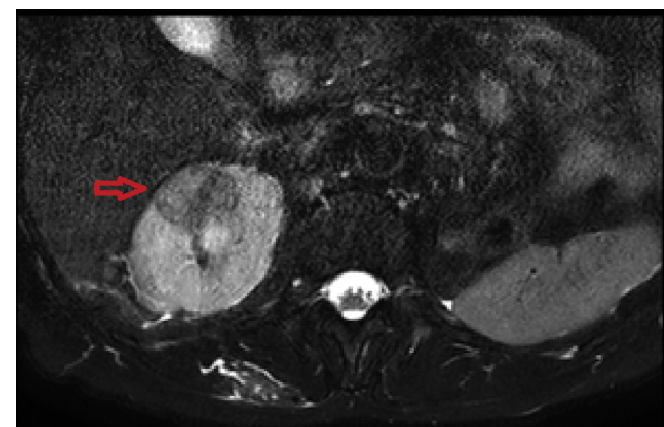


Fig. 2. Axial T2 SPAIR image showing lobular mass in the superior pole of the right kidney.

when they reach a large size and start to exhibit symptoms.² PET/CT scan and MRI helps in understanding the morphology of the tumor but either open or needle biopsy is necessary to make a definitive diagnosis and differentiate RCC metastasis from other soft tissue tumors.^{1,3} In cases where malignancy is proven by a biopsy, the puncture tract should be excised to avoid tumor seeding.¹

Aggressive surgical resection is necessary for metastasized RCC.¹ Surgical resection of metastatic RCC reportedly improves the outcomes, and five-year survival rates are between 35% and 50% after surgical therapy for solitary metastasis.^{1,2} A survival advantage from complete metastasectomy was also observed among patients with multiple, non-lung-only metastases, who had a 5-year survival rate of 32.5% with complete resection and 12.4% without complete resection.²

The unpredictable behavior of RCC suggests the need to perform a thorough follow-up for the patients. An early recognition of tumor recurrence means that the therapeutic approach, whether its surgical metastasectomy or systemic treatment will be more effective.⁵

Conclusion

Maintaining a high level of suspicion when dealing with musculo-skeletal mass in a patient with history of RCC is substantial because early detection of skeletal muscle metastasis from RCC allows for surgical treatment and thus improves the prognosis.

Conflicts of interest

None.

Funding sources

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

References

- Lohiya V, Lohiya S, Windsor K. A large thigh mass: a blood clot or a rare skeletal muscle metastasis from renal cell carcinoma. *SpringerPlus*. 2013;2:399.
- Bhirud PS, Singh R, Bhirud P, Kankalia S. Thigh metastasis of renal cell carcinoma masquerading as soft tissue sarcoma: a role of MRI. *Med J Dr D.Y Patil Univ*. 2014;7(2).

3. Goger YE, Piskin MM, Balasar M, Kilinc M. *Unusual Presentation of Renal Cell Carcinoma: Gluteal Metastasis*. Case reports in urology. Hindawi publishing corporation; 2013. <https://doi.org/10.1155/2013/958957>.
4. Kozak O, Turzynski P, Markiet K, Pienkowaska J, Skrobisz-Balandowska K, Studniarek M. Uncharacteristic metastasis of renal clear-cell carcinoma to the muscles of the forearm-case report. *BJR Case Rep*. 2017;2, 20150495. <https://doi.org/10.1259/bjrcr.20150495>.
5. D'elia C, Cai T, Luciani L, Bonzanini M, Malossini G. Pelvic and muscular metastasis of a renal cell carcinoma: a case report. *Oncol Lett*. 2013;5: 1258–1260.