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Case Report

Acral metastasis in renal cell carcinoma

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Abstract

Renal cell carcinoma (RCC) is one unique urological malignancy with an omnipotent ability of metastasizing to a wide variety of potential sites. Acral metastasis is one such extremely rare event that heralds grave prognostic status of the underlying primary malignancy. We report a 57-year-old gentleman presenting with progressively enlarging swelling on the dorsum of the left hand, evaluation of which lead to the diagnosis of renal cell carcinoma with the seldom reported acral metastasis.

Keywords: Acral, Metastasis, Osseous, Bone, Renal, Carcinoma.

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1. Introduction

Acral metastasis is an extremely rare clinical entity contributing to a meagre 0.1% of all encountered bony metastasis.[1] Discrepancies and debates continue to exist on defining the condition with a majority of published literature depicting the entity as either metastatic disease localized to the hands and feet or as metastases that manifest distal to the elbow and knee.[2] In contrary to the existing dilemmas on the entity, the presence of acral metastases is uniformly considered to be a marker of extensive disseminated underlying primary cancer thereby naturally conferring dismal survival prognosis to the patient.[3] We report a 57-year-old gentleman presenting with progressively enlarging swelling on the dorsum of the left hand, evaluation of which lead to the diagnosis of renal cell carcinoma with the seldom reported acral metastasis.

2. Case Presentation

A 57-year-old diabetic male with history of chronic smoking presented to the orthopedics department with complaints of progressively increasing painful swelling over the dorsum of the left hand, worsened by activity for the past 2 months. Examination revealed a hard tender swelling of size 3 x 3 cm over the dorsum of left hand with preserved range of motion **(Figure 1).** Evaluation with the X-ray of the hand revealed a well-defined expansile osteolytic lesion with cortical destruction arising from the shaft of 3rd metacarpal bone prompting us to consider either a malignant bone lesion or a locally aggressive benign bone lesion **(Figure 2).** Further routine evaluation with chest X-ray and abdominal ultrasonography revealed multiple well defined rounded lesions in bilateral lung fields and a large mass arising from the left kidney occupying almost the entire renal parenchyma. Contrast enhanced computed tomography (CECT) evaluation of the chest and abdominal regions showed well-defined multiple attenuating lesions in bilateral lung fields suggestive of metastasis with an enhancing left renal mass of size 8 x 8cm involving the mid and lower pole with perinephric fat invasion and no vascular extension **(Figure 2).** Considering the extensive metastatic disease burden, the patient was planned for Renal mass biopsy which subsequently revealed clear cell RCC, and patient was initiated on a tyrosine kinase inhibitor (TKI), pazopanib 800mg twice daily for 3 months. Multidisciplinary discussion culminated in the decision to manage the patient expectantly considering the widespread nature of the disease and extremely dismal prognosis. Decision to surgically manage the lytic bone lesion was

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withheld until the first course of TKI management to assess response, progression and general status assessment on the first review visit at 3rd month post initiation of the systemic treatment schedule.

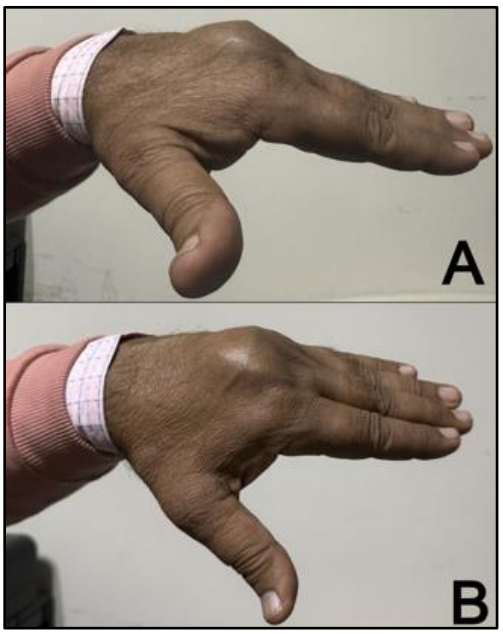

Figure 1: 1A & 1B – Hand Examination revealing swelling of the dorsum of the left hand (Lateral & Anterior View)

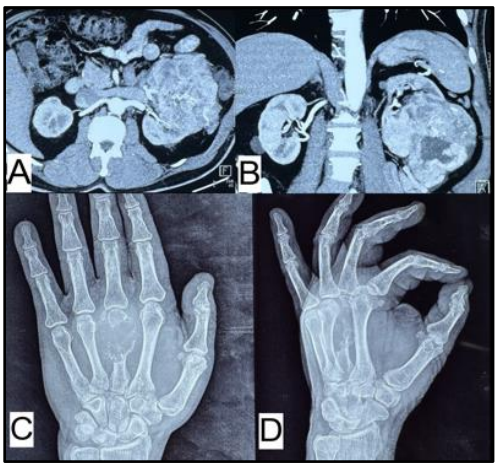

Figure 2: 2A & **2B** – Axial and Coronal sections of CECT abdomen revealing large left renal mass arising from the mid and lower pole extending to the Perinephric fat with no vascular involvement. **2C** & **2D** – X-ray Left Hand Antero-posterior/Oblique view demonstrating expansile well defined lytic osseous lesion involving the shaft of 3rd metacarpal bone.

3. Discussion

Bony metastases are classified based on their location of occurrence into trunk metastases, Arm/thigh metastases (Rhizo-metastases), Forearm/Lower Leg Metastases (Meso-metastases) and Hand/Feet (Acro-metastases).[4] Predisposition to Acral metastases are osseous metastatic lesions that manifest distal to the elbow or knee joint, accounting for only 0.1% of all metastatic bone lesions. The first such lesion was reported by a British surgeon, Handley in 1906.[5] The most common primary site for acral metastasis was lung (34%) followed by gastrointestinal tract (25%) and kidney (10%). They also have tendency to mimic benign disorders like gout, inflammatory or infective arthritis and occasionally, even presenting as the first sign of a disseminated malignancy.[6] Proposed mechanisms of formation include the presence of greater blood supply in the dominant hand owing to increased workload and frequent injuries that disrupt the tissues in vicinity leading to tumor emboli deposition.[7] Acral metastases of the hand were mostly observed to involve the ring finger and thumb in a large series by Stomeo *et al.*[8] Further breaking down on localizations, the distal phalanx was the most frequently involved by acral osseous metastases while metacarpal bones were the second most frequently observed site.[9] Bilateral involvement is rare and is observed in only 9% of patients.[10] Bone is the second most common site of metastasis in RCC harboring poor prognosis with spine and bony pelvis being the predominant sites.[11] The pathogenesis of bony metastasis in RCC has been well studied with predominant elucidated mechanisms being the ability to induce specific immune cells like tumor associated macrophages that exhibit hybrid phenotypes, production of tumor derived extracellular vesicles and epigenetic rewiring.[12] TKIs are the universal preferred option with further secondary modalities ranging from local radiation, resection of metastatic site for palliation, bone fixation, angioembolization and utility of targeted agents such as everolimus and Temsirolimus.[11] Difficulties in devising newer, definitive and successful treatments for bone metastases in RCC are accounted for by the multiple interplays that exist between the Primary bone cells, Bone matrix, Osteoclasts, Osteoblasts, Metastatic tumor cells and other local cells.[12] The complex nature of these interactions hinders targeting such metastatic cells leading to the currently observed high failure rates.[12] To further complicate this process, bone metastasis in RCC further uniquely restricts the anabolic reparative process through a BIGH3/TGFβ1 pathway related paracrine mechanism. This leads to a defective osteoblast differentiation accompanied by induction of osteocyte cell apoptosis further complicating the interactions and making drug targeting extremely difficult.[13] Patients presenting with acral metastasis usually indicate underlying widespread disease with an average survival of 6 months, thus justifying the management strategies being directed more towards palliation rather than on definitive lines.[14]

4. Conclusion

Acral metastases are extremely uncommon presentations of renal cell carcinoma usually signifying sinister unseen underlying widespread disease harboring poor prognosis. A high index of suspicion should be exercised when encountering such presentations as these patients demand prompt detection and initiation of palliative care to ease quality of remaining life.

5. Abbreviations

RCC – Renal Cell Carcinoma, CECT – Contrast Enhanced Computerized Tomography, TKI – Tyrosine Kinase Inhibitors

6. Authors' Contributions

SY was the responsible consultant surgeon in-charge of the overall care of the patient and on whom the final decision on the patient management rested. TKA & SY wrote the first draft of the manuscript. TKA and HS were involved in day-to-day patient care and follow up. HS provided insight and valuable inputs to the manuscript, collected references and was responsible for typography of final manuscript draft.

7. Conflict of Interest

None.

8. Source of Funding

None.

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