

Long-term remission after low dose radiotherapy in patient with extensive squamous cell carcinoma of the hand

A case report

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Abstract

Rationale for Case Report: Cutaneous Squamous Cell Carcinoma (cSCC) of the hand is uncommon and tends to have poorer outcomes. Surgical resection with wide margins around the tumor is recommended as the treatment of choice, and radiotherapy is considered second-line treatment. Nodal evaluation involves dissection necessitating some morbidity. The role of less invasive modalities of nodal evaluation is not well established.

Case Presentation: We report a case of locally advanced case of hand cSCC. Positron emission tomography-computed tomography (PET-CT) showed disease involving full thickness of the hand as well as the ipsilateral axillary node. To achieve adequate surgical margins would have necessitated amputation at the wrist, which the patient did not consent to. Instead, he was given a two-and-a-half week course radiotherapy to the hand without axillary radiation. With the radiotherapy treatment, he managed to achieve complete remission of disease while retaining full function of the hand, which was maintained at 22 months post-treatment.

Main Lessons: cSCC of the hand is uncommon and challenging to treat. Radiotherapy is a highly effective treatment modality which is able to achieve functional preservation. Care should be taken when evaluating nodal status using PET-CT.

Abbreviations: cSCC = cutaneous squamous cell carcinoma, CT = computed tomography, ESR = erythrocyte sedimentation rate, FDG = flourodeoxyglucose, Gy = gray, MV = megavoltage, NCCN = National Comprehensive Cancer Network, PET-CT = positron emission tomography-computed tomography, PTV = planning target volume, UV = ultraviolet.

Keywords: case report, cutaneous squamous cell carcinoma, hand, radiotherapy, skin

1. Introduction

Cutaneous squamous cell carcinoma (cSCC) involving the hand is an unusual occurrence and thought to be associated with worse outcomes. We report a case of extensive, unresectable cSCC of the hand which was treated with a low dose of radiotherapy and achieved complete clinical response with full functional preservation.

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2. Case report

2.1. Presentation

A 69-year-old gentleman with pre-existing type 2 diabetes mellitus presented with an irregular, nodular growth over the left hand which was progressing over 6 months. He was initially thought to have an infected wound and managed with regular wound dressing, but was referred to our tertiary center when the lesion did not respond to treatment. Clinically, the lesion involved both dorsal and palmar aspects of the hand, extending from the carpus to the proximal interphalangeal joints of the index, middle, and ring fingers. The involved skin showed weeping excoriations with punctate bleeding and irregular, raised nodular lesions (Fig. 1).

There were no palpable epitrochlear, axillary, or supraclavicular lymph nodes. Although he did not have fever, the total leukocyte count was 11.9 and the erythrocyte sedimentation rate (ESR) was 50.

Multiple incisional biopsies of the left hand were obtained from both dorsal and palmar aspects of the involved fingers. Histopathological evaluation showed at least squamous cell carcinoma in situ, with 3 of 7 specimens showing foci suspicious of invasion.

A flourodeoxyglucose (FDG) positron emission tomography-computed tomography (PET-CT) scan was done which showed FDG avid soft tissue involving the entire thickness of the hand (SUV_{max} 8.24) (Fig. 2). In addition, FDG avid left axillary lymph

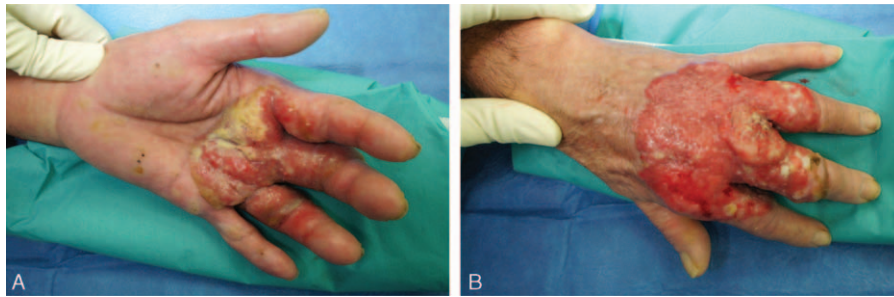


Figure 1. Clinical photographs showing extent of hand involvement at diagnosis.

nodes were seen (SUV_{max} 3.45), the largest measuring 1.7×1.1 cm. Two small FDG avid nodules (SUV_{max} 6.11 and 4.78) were seen in the right lung, suspicious but not conclusive for metastases.

2.2. Treatment

Given the local extent of the disease, surgical resection was deemed too morbid. In view of the possible nodal and distant metastases, palliative radiotherapy was offered to the left hand. Radiotherapy treatment was CT planned, and a total dose of 36 Gray (Gy) was delivered in 12 fractions over the course of two-and-a-half weeks, treating 5 days a week. In addition, 6 megavoltage (MV) photons were used to cover the gross tumor volume with a 1 cm margin with opposed anterior–posterior beams. Boluses were placed over the anterior and posterior aspects of the tumor along with wet gauze in the webspaces of affected fingers to ensure adequate skin dose. This setup was immobilized in a vacuum bag. The whole planning target volume (PTV) was encompassed by 95% of the prescribed dose.

2.3. Treatment response

The patient tolerated treatment well with no significant toxicity. Post-treatment evaluation was done at 4 and 16 weeks after completion of radiotherapy. Nearly complete response was seen at 4 weeks with residual tumor seen only at the webspace between the middle and ring fingers which was visible on both dorsal and palmar surfaces (Fig. 3). At 16 weeks, no visible residual tumor remained, with hypopigmented re-epithelized skin over the previous tumor site. There was no clinical progression of the axillary lymph nodes seen. Also, 6 months after radiotherapy, a computed tomography (CT) scan of the thorax, abdomen, and

pelvis was performed that showed interval stability of the axillary lymph nodes, and resolution of the previously visualized lung nodules. However, 22 months post-radiotherapy, the patient remained disease free and retained full function of the treated hand.

Written consent was obtained from the patient for this case report.

3. Discussion

3.1. SCC hand epidemiology

Site: Nonmelanomatous cancers of skin as a group are exceedingly common, but cSCC involving the hands are relatively rare. When the hand is involved, these tumors tend to arise from the dorsal aspect of the carpal region. Palmar involvement is uncommon.^[1,2]

Several risk factors for cSCC of the hand have been identified. Apart from ultraviolet (UV) light exposure, these include immunocompromised state,^[3] occupational exposure to ionizing radiation, and pre-cancerous conditions such as Bowen's disease.^[4] cSCC of the hand may show more aggressive behavior than those arising elsewhere in the body, with increase rates of recurrence and metastases.^[5,6] This was true particularly for cSCC of the web spaces or dorsum of the proximal phalanges, even if adequate surgical margins were obtained.^[1]

3.2. Nodal evaluation in cSCC

Although only 3% of cSCC involve regional lymph nodes at initial diagnosis,^[7] nodal relapse rates can be as high as 80% for at-risk sites such as the lip.^[8] Current recommendation is for nodal dissection of clinically palpable or enlarged nodes after

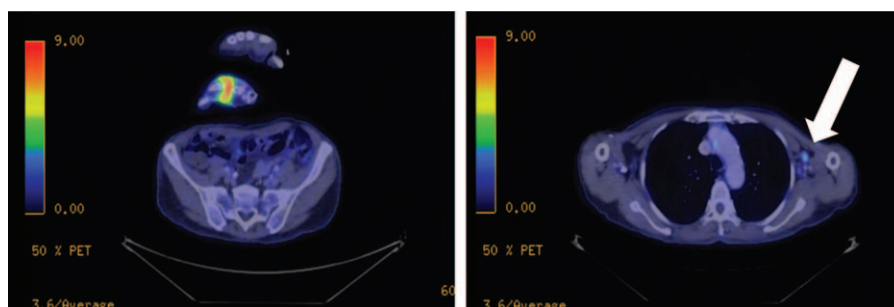


Figure 2. FDG PET-CT findings showing avidity involving the full thickness of the hand and axillary lymph node uptake (white arrow). FDG = flourodeoxyglucose, PET-CT = positron emission tomography-computed tomography.



Figure 3. Post radiotherapy response at (A) 1 month and (B) 7 months.

involvement is confirmed with core biopsy or fine needle aspiration of the enlarged node.^[9] The recommendations for clinically normal nodes is observation.^[7,9] Nonetheless, there is concern that observation alone may constitute undertreatment in the population of patients at high risk who harbor subclinical disease in the nodal basin. These include those with risk features of poorly differentiated SCC, lymphovascular invasion, and perineural invasion. Several approaches have been proposed to detect and eradicate subclinical nodal metastases without the morbidity of a full nodal dissection. These include sentinel node biopsy^[10] and specialized imaging techniques such as FDG-PET. The role of sentinel node biopsy is fairly well defined in cutaneous melanoma, but its accuracy and prognostic value in cSCC remains to be proven.^[11,12]

3.3. Imaging in cSCC

Though the role of FDG-PET is well documented in melanomas and mucosal SCC, there is limited data on its utility in staging of cSCC. Cho et al^[13] reviewed 12 patients with cSCC who underwent FDG PET evaluation. Of these, 3 patients (25%) were found to have nodal involvement, and lung metastases were found in 1 patient (8.3%). However, the design of the study did not allow for evaluation of the sensitivity and specificity of FDG-PET in determining nodal and distant metastases. Although PET-CT may have the advantage of identifying any synchronous distant metastases, its accuracy in nodal evaluation remains unproven. The clinical course of our case has demonstrated that PET-CT can result in false positives when used to evaluate nodal disease.

3.4. Treatment modalities

Surgical resection either with a wide margin or with Moh's micrographic surgery is regarded as the gold standard treatment for SCC.^[9] Excision with margin of 4mm is recommended for lesions smaller than 2 cm, and 6 mm for larger lesions.^[9] On the other hand, ray amputations may be required to achieve sufficient

margins. Most published case reports and series employed surgical resection rather than radiotherapy as the primary treatment.

Published guidelines recommend that radiotherapy may be selected as the primary treatment in place of surgery due to considerations of function, cosmesis, and patient preference.^[9] The hand presents a unique site where deep structures are critical to function, and radiotherapy can serve as an alternative to the morbidity of surgical resection.

National Comprehensive Cancer Network (NCCN) guidelines recommend that bulky tumors treated primarily with radiotherapy for cure should receive radiobiological doses equivalent to 58 Gy in 2 Gy fractions.^[9] There is data to suggest that hypofractionated radiotherapy to a doses equivalent to 53 Gy may be sufficient for local control,^[14] but our patient achieved durable remission even with 39 Gy.

CSCC arising in certain sites pose a therapeutic challenge for radiotherapy. In sites where involved skin overlie bone, there are concern of osteoradionecrosis with high doses of radiotherapy. These may be overcome with specialized radiotherapy techniques. Where the expertise is available, brachytherapy can be used as an alternative modality of radiotherapy delivery where linear accelerator-based treatments cannot achieve therapeutic goals.^[15,16] Tomotherapy has also demonstrated utility in extensive, circumferential skin cancers arising in the trunk.^[17]

4. Conclusion

Cutaneous SCC of the hand is an uncommon tumor. Care should be taken when interpreting nodal and distant metastatic findings in PET-CT. Radiotherapy is a useful treatment modality when surgery is contraindicated. Even low doses of radiotherapy can achieve durable local control with good functional outcomes.

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