Cutaneous metastasis of prostate carcinoma treated with electron radiotherapy

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Introduction: Prostate carcinoma is typically diagnosed and treated, and it rarely manifests as cutaneous metastases. We herein report electron radiotherapy for the treatment of cutaneous metastases causing cellulitis, with a durable clinical response achieved.

Case presentation: A 70-year-old male patient with scrotal cutaneous metastasis of prostate carcinoma was undergoing treatment with docetaxel chemotherapy due to recurring cellulitis originating from the scrotum, and his treatment was interrupted. We administered electron radiotherapy to the scrotal cutaneous metastasis lesions, as irradiation was difficult, and obtained a good clinical effect. Subsequently, he continued chemotherapy, and the scrotal lesions remained clear and dry with no recurring cellulitis for 1 year.

Conclusion: Electron radiotherapy is one of the safe and effective treatment options for controlling cutaneous metastasis of prostate carcinoma.

Key words: cellulitis, cutaneous metastasis, electron radiotherapy, prostate carcinoma, scrotum.

Keynote message
Prostate carcinoma rarely manifests as cutaneous metastases. The patient complained of discomfort and a reduced quality of life, and the metastasis caused cellulitis, and treatment interruption. We obtained a good clinical effect by treating the spherical cutaneous metastasis lesions in the scrotum, where irradiation was difficult, using electron radiotherapy.
about 4 cm in size with a thickness of <5 mm. A histological examination of a punch biopsy on a sample lesion showed the presence of metastatic adenocarcinoma in the dermis (Fig. 2a). Although the specimen did not stain for PSA clearly, it stained for P504S (Fig. 2b), which is consistent with prostate carcinoma. Following antiandrogen therapy, although the PSA levels became undetectable, bone metastasis was detected. The patient consequently underwent docetaxel chemotherapy, following which repeated cellulitis spread from the scrotum in the form of cutaneous metastasis. Treatment with local washing and inunction was ineffective. After consulting with a dermatologist and radiotherapist, we considered performing radiotherapy for infected lesion, as surgical treatment appeared to carry a high risk. Even if electron radiotherapy proved insufficient, the metastatic lesions would likely have been reduced in size, to the point that surgical treatment with a sufficient extent of resection might be possible.

Subsequently, we administered electron radiotherapy (total 60 Gy) to the spherical cutaneous metastasis lesions in the scrotum. As a result, the metastatic lesion responded well clinically disappeared. Skin toxicity such as moderate erythema and edema, and patch moist desquamation was observed; however, they were self-limited and resolved within 4 weeks.

After electron radiotherapy, the patient continued chemotherapy, and the scrotal lesions remained clear and dry (Fig. 1b), with no recurring cellulitis for 1 year.

**Discussion**

In prostate carcinoma, cutaneous involvement generally presents in the later phases of the disease and is associated with a poor prognosis. Indeed, the mean survival time following a diagnosis of cutaneous metastasis has been reported to be approximately 7 months, because a majority of these patients already have advanced disease. Antiandrogen therapy and chemotherapy have been used to treat cutaneous metastasis, albeit without much success. It was recently reported that radiotherapy achieved a good response to cutaneous metastasis of prostate carcinoma. In the present case, cutaneous metastasis caused discomfort as well as a reduced quality of life and led to cellulitis, with treatment interruption. We herein report an effective treatment approach using electron radiotherapy that provided a durable clinical response for cutaneous metastases in the spherical scrotum.

Electron radiotherapy is typically performed for cutaneous carcinoma on the body’s surface and cutaneous metastases. In such cases, this approach has the advantage of having a shallow and small radiation area, thereby preventing damage to the normal cellular organization surrounding the carcinoma. To achieve the peak electron beam dose of the peculiarity of the present case, the target volume was set by adding a 1.0- to 1.5-cm margin to the gross tumor volume. The planning target volume was then created with an additional 5-mm set-up margin on top of the clinical target volume. A custom lead block was made to encompass the planning target volume. A 5-mm bolus material equivalent of water density was applied to compensate the skin surface dose. Planning CT scan with the bolus in place was performed to simulate the dose distribution and aid in selecting the electron energy (Fig. 3). The patient received hypofractionated 6-MeV electron beam radiotherapy consisting of 20 fractions of 2 Gy for a total of 60 Gy, prescribed at the peak depth 1.2 cm. With accurate treatment planning and effective radiation therapy, we were able to successfully target the
Cutaneous metastasis can be seen in any malignancy at various sites of the body (e.g., scalp metastasis from breast cancer, nasal skin metastasis from lung cancer, etc). Distant metastasis is usually considered as systemic disease and local treatment needs to be less invasive. Palliative radiotherapy is often indicated for such cases. Scrotal cutaneous metastasis was generally thought to be technically difficult to irradiate effectively due to its location. What was fortunate for the current case was that the patient could open legs wide enough so as to let the scrotum flattened by manual traction of the scrotum with his hands and therefore be irradiated perpendicularly by electron.

Cutaneous metastasis of prostate carcinoma is present at an overall rate of 0.09% among patients with prostate carcinoma. In addition, there exists the possibility that a skin lesion may represent an undiagnosed metastasis. The number of prostate carcinoma has been increasing rapidly in recent years, and the development of cutaneous metastasis, as observed in the present case, appears to be increasing at a constant rate. Castration resistance, a curative approach to prostate carcinoma, has seen a tremendous increase, thereby leading to higher expectations of long survival. A careful examination of the patient’s skin must be performed when rashes or nodules are noted in patients with prostate carcinoma in order to promptly detect cutaneous metastasis and perform treatment.

Electron radiotherapy is one of the safe and effective treatment options for controlling cutaneous metastasis of prostate carcinoma.

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Conflict of interest

The authors declare no conflict of interest.

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