

Radiotherapy with Adult Immunization in Recurrent Dermatofibrosarcoma Protuberans: A Case Report

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Abstract: *Dermatofibrosarcoma protuberans (DFSP) is a rare soft-tissue sarcoma characterized by slow growth but a strong tendency for local recurrence. Surgery is considered the primary treatment, while radiotherapy has an important role in recurrent or unresectable disease. We report a case of a 53-year-old male who initially presented with a large DFSP in the D8–L4 paravertebral region that was surgically excised with immunohistochemistry confirming the diagnosis. The patient was subsequently lost to follow-up. One year later he developed localized recurrent disease in the D11–D12 paravertebral region confirmed on MRI and PET-CT but declined re-surgery or biopsy. He was treated with definitive radiotherapy (50 Gy in 25 fractions) along with an adult vaccination protocol and achieved a complete metabolic response on follow-up PET-CT. This case highlights the role of radiotherapy in recurrent DFSP and emphasizes the importance of comprehensive supportive care, including adult immunization, during cancer treatment.*

Keywords: Dermatofibrosarcoma protuberans, radiotherapy, adult vaccination, PET-CT, soft tissue sarcoma

1. Introduction

Dermatofibrosarcoma protuberans (DFSP) is an uncommon soft-tissue sarcoma accounting for less than 0.1% of all malignancies. It typically presents as a slow-growing but locally aggressive tumor that frequently arises on the trunk and proximal extremities. Despite its indolent biological behavior, DFSP is notable for a high rate of local recurrence due to its infiltrative growth pattern.

The molecular hallmark of DFSP is the t(17;22) chromosomal translocation leading to the COL1A1–PDGFB fusion gene, which results in continuous activation of PDGFR- β signaling and uncontrolled fibroblastic proliferation. The standard management approach involves wide local excision or Mohs micrographic surgery with negative margins. However, achieving adequate surgical margins may be challenging in certain anatomical locations, leading to local recurrence.

Radiotherapy has therefore emerged as an effective treatment modality in recurrent disease, positive margins, or when further surgery is not feasible. Studies have demonstrated high local control rates with radiotherapy doses ranging from 50 to 70 Gy.

Another important aspect of cancer care is immune health during treatment. Radiation therapy may induce transient lymphopenia and immunosuppression, increasing the risk of infections and treatment interruptions. Adult vaccination strategies such as influenza, pneumococcal, hepatitis B, and herpes zoster immunization may reduce infection-related morbidity in oncology patients. Additionally, vaccination may stimulate immune responses that could potentially complement radiation-induced antitumor immunity. This case highlights the successful management of recurrent DFSP with definitive radiotherapy and discusses the potential supportive role of adult vaccination during treatment.

2. Treatment Summary

53-year-old male

Brief Medical History – Not Significant

Initial Presentation (Year 0)

- Presented with large mass over back associated with back pain
- CE-MRI Dorsolumbar spine showed $21 \times 7.7 \times 5.9$ cm mass (D8–L4 paravertebral region)
- CECT chest/abdomen/pelvis showed non-metastatic disease
- Underwent wide local excision (WLE) of mass involving D8–L4 paravertebral region
- Histopathology report unavailable; IHC suggestive of DFSP
- Patient was lost to follow-up and received no adjuvant therapy

Residual/Recurrence (1 Year Later)

- Presented with lower-back pain
- MRI showed recurrent disease measuring $4.1 \times 3.2 \times 5.3$ cm (D11–D12 paravertebral region)
- Whole-body PET-CT showed no distant metastasis
- Patient declined biopsy and re-surgery after informed discussion

Definitive Radiotherapy

- Dose: 50 Gy in 25 fractions
- Schedule: 5 fractions per week over 5 weeks
- Target: D11–D12 paravertebral disease with appropriate margins while respecting OAR constraints

Adult Vaccination Protocol

- Influenza – once yearly
- Shingles – dose 1 and dose 2 after 2 months
- Tdap – once in a lifetime
- Pneumococcal – dose 1 and dose 2 after 2 months
- Hepatitis B – 0, 1, 2 and 6 months schedule

Follow-Up

A follow-up PET-CT performed post completion of treatment

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(post RT and post Vaccination) demonstrated complete metabolic response with no residual or metastatic disease.

3. Discussion

Radiotherapy plays a crucial role in the management of recurrent or unresectable DFSP. The tumor is known to be radiosensitive, and studies have reported local control rates of approximately 85–95% with radiation doses between 50 and 70 Gy. Radiotherapy may therefore serve as an effective curative option in patients who decline or are not suitable for repeat surgical intervention.

Modern radiation delivery techniques such as intensity-modulated radiotherapy (IMRT) and image-guided radiotherapy (IGRT) enable precise dose delivery to the tumor while minimizing exposure to surrounding normal tissues. These advances have improved treatment outcomes and reduced toxicity in soft-tissue sarcoma management.

Radiotherapy can also induce immunogenic tumor cell death, releasing tumor antigens that stimulate systemic immune responses. However, treatment-related lymphopenia may impair host immunity and predispose patients to infections. Such infections may lead to treatment interruptions and compromise therapeutic outcomes.

Adult vaccination in oncology patients has therefore gained increasing importance. Vaccination against influenza, pneumococcus, hepatitis B, and herpes zoster may reduce infection-related complications during treatment. Preventing infections helps maintain treatment continuity and improves overall patient well-being.

Vaccination may also support immune recovery and enhance immune surveillance. Activation of antigen-presenting cells and stimulation of adaptive immune responses following vaccination may theoretically enhance recognition of tumor antigens released during radiation-induced cell death. Although further studies are needed, this potential immunologic synergy may contribute to improved therapeutic outcomes.

In the present case, definitive radiotherapy achieved complete metabolic response on follow-up PET-CT imaging. The addition of adult vaccination was aimed at supporting immune health during treatment and reducing the risk of infection-related complications. This approach highlights the importance of integrating oncologic therapy with preventive healthcare strategies.

4. Conclusion

Radiotherapy represents an effective treatment option for recurrent or inoperable DFSP and can achieve excellent local control with modern techniques. Supportive measures such as adult vaccination may improve patient outcomes by reducing infection risk and supporting immune function during therapy. Integrating oncologic treatment with preventive healthcare strategies may represent a comprehensive approach to cancer care.

Ethical Approval and Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given consent for clinical information to be reported in the journal while maintaining anonymity.

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Conflict of Interest

The authors declare no conflicts of interest.

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