Cutaneous Recurrence of Extramedullary Multiple Myeloma within Surgical Scar Tissue

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Introduction

Multiple Myeloma (MM) is a malignancy of mature B cells that are defined by the presence of greater than or equal to 10% clonal plasma cells in the bone marrow or a biopsy-proven plasmacytoma, along with a myeloma defining event, characterized by end-organ damage such as hypercalcemia, renal insufficiency, anemia or bone lesions.[1] In many cases, the abnormal plasma cell proliferation remains localized to the bone marrow; however, patients will rarely develop soft-tissue plasmacytomas, in which clonal plasma cells spread to locations outside the marrow.[1] Extramedullary relapse in MM is rare, with incidence varying between 0.5% and 4.8% in newly diagnosed patients and between 3.4% and 14% in patients with relapsed or refractory disease.[1] Cutaneous involvement is even more uncommon, and it is observed in less than 1% of MM cases, often correlating with aggressive disease subtypes like osteolytic lesions.[2] Scar-site recurrences are uncommon and poorly understood in current literature, with only a handful of cases documented.

Background

The patient in this case a 55-year-old male with a history of IgA lambda subtype multiple myeloma. He originally presented one year earlier with progressively worsening back pain. His disease was subsequently discovered, along with pathological fractures to his lumbar spine. As a result, he underwent posterior spinal instrumentation fusion (PSIF) from T12 to L4 with an L2 laminectomy performed by neurosurgery. Following surgery, he was treated with daratumumab, lenalidomide, bortezomib, and dexamethasone (Dara-RVd), followed by an autologous stem cell transplant. He was then placed in maintenance therapy with daratumumab plus lenalidomide (Dara-Len) with a plan to continue this for two years.

Presentation

Upon presenting for a routine Dara-Len treatment, he complained of a new painful “lump” along his incision site, along with a change of size and color of the scar. On physical examination, he exhibited erythematous, firm nodules along the surgical scar (Figure 1). He otherwise denied systemic symptoms. An MRI was subsequently performed for further evaluation (Figure 2 & 3), which demonstrated extensive soft tissue involvement along the surgical site, including lesion in the ventral spinal canal. A punch biopsy of the lesion confirmed recurrent MM. A PET/CT was then obtained for staging (Figure 4), that further showcased the extent of the local disease but showed no evidence of distant metastasis.

Clinical Course

Approximately one month after initial presentation of his recurrent disease, the patient was initiated on Bortezomib-thalidomide-dexamethasone-cisplatin-doxorubicin-cyclophosphamide-etoposide (VTD-PACE). A subsequent PET/CT performed two months after treatment demonstrated a good response (Figure 5). He then began chimeric antigen receptor T-cell therapy (CAR-T) and continues remain disease-free on subsequent PET/CTs that were performed for surveillance.

Discussion

Multiple myeloma (MM) primarily affects the bone marrow and skeletal system, but extramedullary relapse is increasingly recognized and is associated with aggressive disease and poorer prognosis.[3] Cutaneous involvement is exceedingly rare, particularly when it is localized to prior surgical scars, with only a handful of cases described in literature.[2, 4, 5, 6] These include reports of relapse at pacemaker insertion sites, sternotomy scars, fracture sites, and orthopedic surgical incisions. Such cases suggest that surgical scars and trauma may act as permissive niches for malignant plasma cell proliferation.[2, 4, 5, 6] Although these precise mechanisms remain unclear, proposed contributors include local immune dysregulation, altered vascular microenvironments, impaired wound healing, or iatrogenic tumor seeding during surgery.[7]

Our patient’s presentation is distinct in several ways. First, the relapse occurred rapidly and progressed along a prior laminectomy scar, extended into paraspinal muscles and intradurally to T12, without concurrent bone marrow involvement. This pattern differs from typical MM relapse, which is primarily marrow-based. Second, the cutaneous and subcutaneous nature of the recurrence highlights the importance of continuous monitoring and recognition of atypical scar-associated lesions in MM patients, which can be at first mistaken for benign post-surgical changes or dermatologic conditions. Finally, our patient had a strong response to VTD-PACE, even prior to receiving CAR-T. Other cases of extramedullary spread to scar tissue typically were associated with a poor prognosis.[4,5,10] This avenue of therapy could be uniquely suited to treat this rare manifestation of MM.

The existing literature raises questions regarding why some patients develop scar-site relapses. Current studies highlight potential contributions of local immune alterations, vascular changes, or direct tumor seeding during surgery, but no definitive mechanism has been established.[7] This uncertainty mirrors the broader gap in understanding extramedullary MM pathogenesis and its particular predilection for sites of prior tissue injury or surgical scarring.

Management of the scar-site extramedullary relapse remains challenging because of its aggressive behavior and lack of standardized treatment strategies. Systemic chemotherapy remains the cornerstone treatment of choice, while localized therapies like palliative radiation or surgery can provide symptomatic relief.[8,9] In this case, the patient was previously treated with Dara-RDv and put on maintenance Dara-Len. Unfortunately, he relapsed while on this treatment regimen and was subsequently started on VTD-PACE chemotherapy as a means to address widespread extramedullary disease burden and preserve the option for CAR-T therapy. With his favorable response to VTD-PACE and continued lack of disease evidence on surveillance imaging highlighting a promising therapeutic strategy combininging intensive chemotherapy and immunotherapy for managing rare extramedullary relapses of MM.

Images

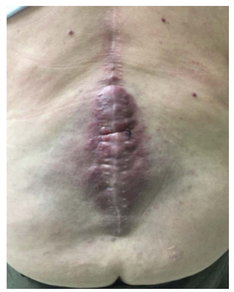

Figure 1

This showcases an image of the patients back upon initial presentation. Of note, the lesion is located within close proximity to his surgical scar

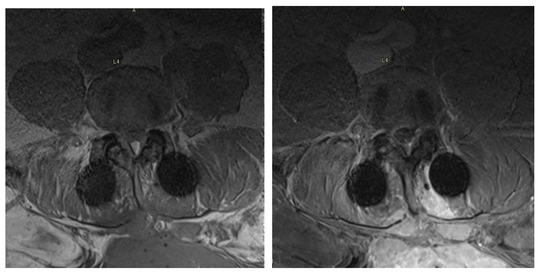

Figure 2 (left) and Figure 3 (right)

This showcases an axial T2 weighted MRI in the pre-contrast (Figure 2) and post-contrast (Figure 3) state. It can be visualized here that there is a T2 isointense lesion within the cutaneous and subcutaneous tissue that extends into the paraspinal musculature and enhances with contrast

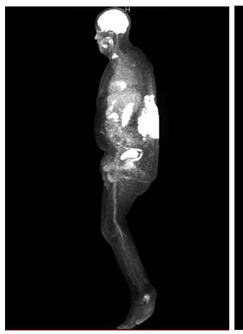

Figure 4

This showcases a PET MIP that the patient underwent upon initial presentation. Of note, besides excepted FDG activity within organs such as the brain and bladder, there is significant metabolic activity within the lumbar cutaneous and subcutaneous tissue

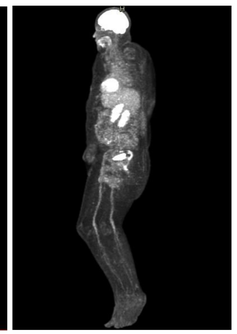

Figure 5

This showcases a PET MIP of the patient post-VTD-PACE treatment. Of note, compared to his PET prior to treatment, there has been significant decrease in metabolic activity within the lumbar cutaneous and subcutaneous tissues

Conclusion

We report a rare case of rapidly progressive extramedullary relapse of IgA lambda multiple myeloma localized to a primary lumbar laminectomy scar, with extension into paraspinal muscles and an intradural lesion at T12, in the absence of bone marrow involvement. Scar-site relapse of MM is extremely uncommon and highlights the importance of early recognition of atypical cutaneous or post-surgical lesions in MM patients. Careful coordination of systemic chemotherapy with immunotherapy options such as CAR-T therapy may prove successful in treating such cases. Further studies are needed to understand mechanisms and optimize management of extramedullary scar-site MM. Documentation of such unusual presentations such as this contributes to a growing understanding of extramedullary disease patterns, helping clinicians to recognize atypical patterns of disease and make informed decisions about management to best treat patients.

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