Cutaneous plasmacytoma: Metastasis of multiple myeloma and invasion of sternotomy scar

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INTRODUCTION

Multiple myeloma (MM) is a rare cancer of plasma cells that typically remains in the bone marrow where cell proliferation leads to the typical CRAB symptoms of hypercalcemia, renal insufficiency, anemia, and lytic bone lesions. Under conditions that are not yet fully elucidated, MM can present with cutaneous involvement in less than 1% of cases, usually the result of direct extension from osteolytic lesions.[1] To the best of our knowledge, we document the first biopsy-proven case of a cutaneous plasmacytoma occurring over an antecedent sternotomy scar without evidence of underlying MM involvement of the sternum. We describe its rapid and complete clinical resolution using second-line chemotherapy, pomalidomide, and low-dose dexamethasone. Although 7 cases of cancer metastases to distant cutaneous scars have been reported,[2,3] to date, this represents the first biopsy-proven case in a cutaneous plasmacytoma.

Abbreviations used:

IL: interleukin
MM: multiple myeloma
SUV: standardized uptake value

CASE REPORT

An 86-year-old African-American man presented with 2 large pink-red to violaceous plaques on the lower chest (Fig 1, *A*) and a palpable subcutaneous right medial thigh mass. He had a history of stage III IgG λ MM diagnosed 28 months earlier, which was treated with 6 cycles of bortezomib, dexamethasone, and zoledronic acid that concluded in March 2016. With initial treatment, his monoclonal IgG λ decreased from 5.4 g/dL to 0.1 g/dL and free λ light decreased from 0.2 g/dL to undetectable levels on protein electrophoresis. Even with a 96.3% decrease in serum M-protein, the patient fell within the stable disease response category according to the International Myeloma Working Group uniform response criteria because of the lack of urine M-protein testing. He presented to the internal medicine clinic where he was given antibiotics for presumed cellulitis, but the chest plaques persisted. Computed tomography (CT) scan found multiple lobulated soft tissue subcutaneous masses in the lower anterior chest wall along the incision line of previous sternotomy with the dominant mass 5.7 × 5.7 × 7.5 cm (Fig 2). Subsequent positron emission tomography/CT found extensive nodular soft tissue thickening anterior to the sternum showing increased metabolic activity. Additionally, there were few mildly hypermetabolic subcutaneous soft tissue masses adjacent to the right mid sartorius, suggestive of further myeloma involvement.

Microscopic examination of the mid chest plaque found atypical mononuclear cells in the dermis with some clock-face nuclei, moderate cytoplasm, and pleomorphism. The cells stained strongly with antibodies against CD138 and stained with λ by in situ hybridization but did not stain with κ (Fig 3). The presence of cutaneous lesions led to further testing, which found a relapse of the patient's MM. Serum

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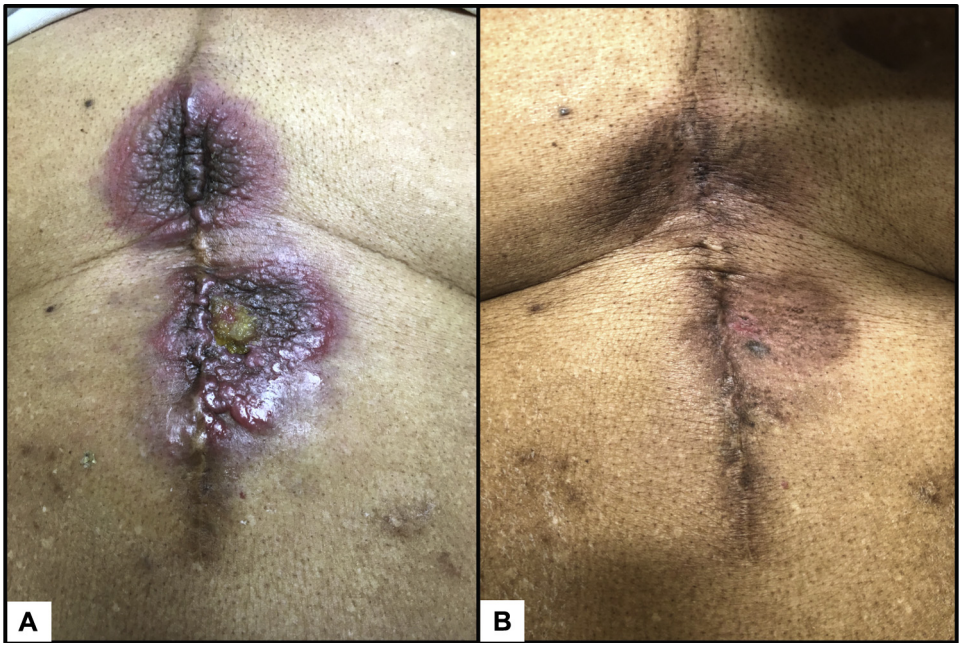

Fig 1. Large indurated violaceous plaques over sternotomy scar. **A**, Before and **B**, after treatment with chemotherapy.

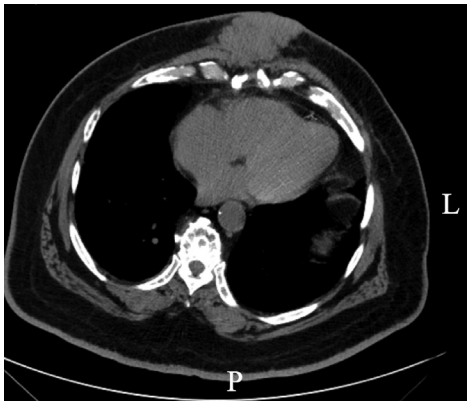

Fig 2. Chest CT. Lobulated soft tissue subcutaneous mass identified in the lower anterior chest wall along the incision line of previous sternotomy (L, left; P, posterior).

protein electrophoresis found an aberrant band consistent with the patient's known monoclonal IgG λ at 1.9 g/dL and monoclonal free λ light chain at 0.1 g/dL. Urine protein electrophoresis found monoclonal free λ light chain at 10% and monoclonal IgG λ at 8% of total urinary protein. The patient's relapsed multiple myeloma and cutaneous plasmacytoma were treated with 3 cycles of pomalidomide and dexamethasone and 1 cycle of daratumumab, but the patient never completed the daratumumab because of heart failure exacerbation at the time of infusion. He experienced complete clinical resolution of the chest plaques (Fig 1, *B*) and subcutaneous right medial thigh mass. Although the subcutaneous thigh mass was thought to represent a plasmacytoma, it was not biopsied. Because of other health concerns, he is currently off all chemotherapy but remains asymptomatic with stable disease and is closely followed up by the oncology department.

DISCUSSION

MM is a plasma cell neoplasm that was once considered an incurable disease. With the advent of novel therapies, the goal of treatment has changed to increased progression-free survival and potential cure. Neoplastic cutaneous plasma cell proliferations fall into 3 categories: (1) primary extramedullary plasmacytoma, (2) cutaneous plasma cell neoplasm in the setting of previously diagnosed MM, and (3) cutaneous plasma cell neoplasm from direct extension of osteolytic lesions in MM. Cutaneous plasma cell neoplasms in the setting of an established diagnosis of MM is very rare. In a study by Malysz et al,[4] of a database of 675 patients with MM, only 1.9% presented with cutaneous involvement. In a multi-institutional retrospective study of 53 patients by Jurczyszyn et al,[5] cutaneous involvement was seen most commonly in the chest (44%), followed by lower extremities (24%), back/buttocks (22%), face/neck (20%), and upper extremities (18%), with 40% of patients presenting with stage III, 32.5% with stage II and 27.5% with stage I disease at the time of diagnosis.

Local seeding and direct extension from osteolytic lesions of MM can lead to the development of cutaneous plasmacytomas.[6] Extramedullary disease in MM tends to occur with relapses and typically

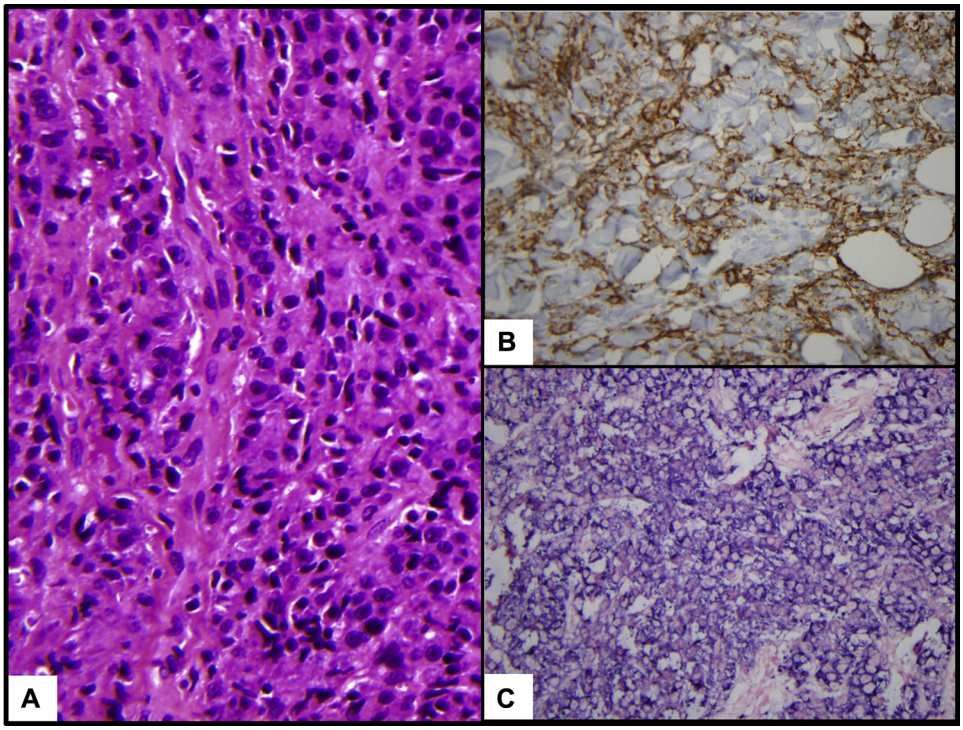

Fig 3. Plasmacytoma. **A**, Pleomorphic atypical plasma cells in the dermis with some clock-face nuclei and moderate cytoplasm. **B**, There is strong staining with antibodies against CD138. **C**, The cells stain with λ by in situ hybridization and do not stain with κ (not shown) by qualitative in situ hybridization. (**A**, Hematoxylin-eosin stain; **B**, CD138 stain; **C**, λ stain; original magnifications: **A**, ×40; **B** and **C**, ×100.)

portends a poor prognosis.[7] In a study of 1003 consecutive MM patients, extramedullary myeloma occurred in 6% of patients with progressive disease or relapse.[8] It can be postulated that extramedullary disease in MM occurs as a result of bone marrow escape of plasma cell clones that have either decreased cell adhesion or that acquire characteristics of plasma cells such as those observed in plasma cell leukemia. Although it has been noted that surgical procedures can facilitate metastasis, and plasma cell migration may be improved in the initial stages of wound healing through the release of stromal cell–derived factor-1, interleukin (IL)-6, IL-3, IL-10, and tumor necrosis factor-α,[9,10] it is unlikely that our case represents locoregional seeding because of the absence of noted MM involvement of the sternum around the time of the sternotomy and delayed presentation after completion of combination chemotherapy. An alternative mechanism would be systemic spread through altered lymphatics or hematogenous dissemination into the scar tissue, which may have provided the malignant plasma cells with a favorable environment.

This report is of a rare case of cutaneous involvement of MM in an antecedent sternotomy scar. The discovery of this cutaneous lesion led to further imaging and biopsy, which found a cutaneous plasmacytoma and relapse of MM. This finding, overlying an antecedent sternotomy scar, supports the possibility of a pathophysiologic mechanism in which scars provide a nidus for tumor cell adhesion. We assert that dermatologists are uniquely positioned to evaluate surgical scars and be the first to identify cutaneous plasmacytomas and relapses of MM.

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