Graft-versus-host disease: A rare complication of device implantation

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Introduction

The most common clinical feature of chronic graft-versus-host disease (GVHD) is skin involvement, which is present in 67% of patients with chronic GVHD.[1] We report a case of chronic GVHD that was caused by an implantable cardioverter-defibrillator (ICD). To our knowledge, there have been no reported cases of this condition.

Case description

We present a 55-year-old Caucasian man with ischemic cardiomyopathy and acute myeloid leukemia, for which he had undergone successful stem cell transplantation but which was later complicated by chronic GVHD. He was hospitalized 2 months after dual-chamber ICD implantation for concerns of pocket infection and treated with intravenous antibiotics. His initial case of acute GVHD was several months after his stem cell transplant and was localized to the skin on his hands. This was successfully treated with cyclosporine and triamcinolone cream. He subsequently experienced chronic GVHD over 50% of his body surface, proven by skin biopsy, with sicca syndrome and was started on systemic steroids, which resolved his symptoms.

He was seen for an evaluation of an inflammatory skin lesion overlying his ICD (Figure 1). There had not been a definite diagnosis as to the cause of this erythema. The skin lesion was an approximately 3 × 3-cm atrophic patch directly overlying the ICD device module with mild peripheral erythema, prominent telangiectasias, and central honey-colored crusting. There was no drainage, discharge, dermal induration, or scale. The patient had negative cultures, leukocytosis of unknown etiology, and no fevers or chills, and was started on vancomycin and cefepime for a possible infection of the site. A transesophageal echocardiogram was done and showed no endocarditis of the pacemaker leads. He had already had an ICD generator change in the past without resolution of the symptoms. He was found to have no extravasation of white blood cells to the ICD site on white blood cell scan. He was also found to have an irregular nevus lateral to the pacemaker site. A shave biopsy was performed and shown to be melanoma. He underwent wide local excision of the melanoma lesion as well as repositioning of the ICD underneath the left pectoralis muscle, as it was felt that the erythema surrounding the device could be due to an allergy to a compound of the device. The surgical pathology showed no evidence of residual melanoma in the skin. However, the soft tissue around the ICD did show dense sclerosis with brisk lymphoplasmacytic infiltrate that was much more robust than would be seen in the reactive soft tissue capsule that typically surrounds implanted devices like ICDs. Given the known history of chronic GVHD in the skin in this patient, the pathologist interpreted the changes as most consistent with the sclerodermoid form of chronic GVHD. A metal allergy was a considered possibility histologically

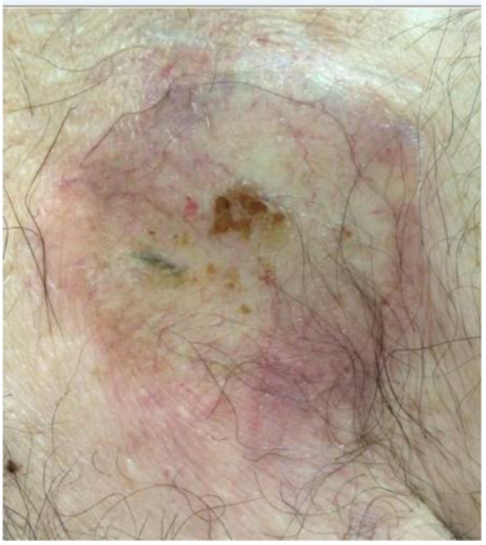

Figure 1 Photograph of the skin overlying the implantable cardioverter-defibrillator on the left upper chest.

KEYWORDS Graft-versus-host disease; Device implantation complication; ICD; Autoimmune reaction; Post stem cell transplant
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KEY TEACHING POINTS

- Graft-versus-host disease (GVHD) may manifest over an implantable cardioverter-defibrillator implantation site.
- We believe that it is important to include GVHD when cultures are negative and antibiotics have not subsided symptoms, especially in a patient who has undergone allogeneic hematopoietic cell transplantation.
- Early diagnosis and treatment are critical to improve outcome of GVHD.

but was less favored, given the clinical history of extensive chronic GVHD of the skin. Antibiotics were discontinued and the dose of steroids was increased, with subsequent resolution of his symptoms.

Discussion

The incidence of complications with device implantation has been reported to be approximately 3%-6%.[2] The most common complications of device implantation are pneumothorax, infection, and device-pocket hematoma requiring evacuation.[3] In a study looking at the long-term outcome at 4 years after ICD implantation, the most common adverse effects were infections, lead dislodgements, and lead malfunctions.[4] Chronic GVHD is a multisystem disease that can manifest in any organ.[5] However, skin and oral mucosa are the most common manifestations of GVHD.[6] GVHD manifestation in the skin can be classified into 2 major forms: lichenoid (lichen planus–like) or sclerodermoid (scleroderma/morphea-like) lesion.[1] Chronic GVHD usually develops 4 months after transplantation, but manifestations can start appearing as early as 40 days following transplantation.[7] Chronic GVHD can occur after previous instances of acute GVHD (32% of cases).[7] GVHD can develop spontaneously or as a result of a trigger.[7] After a thorough literature search, we do not believe that there is any population outside of the allogeneic hematopoietic cell transplant population for whom a consideration of GVHD is relevant. There are several proposed immune-mediated mechanisms of this disease process, as well as several identifiable triggers, including UV irradiation, physical trauma, infection with herpes zoster, and *Borellia* species.[7] The histologic features of GVHD, whether in the skin or around an ICD as in this case, are not entirely specific and must be interpreted by the pathologist within the clinical context. The presence of dense sclerosis with brisk inflammation fit well with the histologic features that are often seen in chronic GVHD of the skin. Those features, in conjunction with the history of stem cell transplant and known chronic GVHD involving 50% of the body surface area, made the pathologist favor a diagnosis of chronic GVHD involving the ICD. Allergic reaction was also considered but was less favored, given the known history. In our case, the patient had several risk factors for developing chronic cutaneous GVHD overlying his device. This process could have been the result of prior mantle radiation therapy, of initial device placement, or of the device or device pocket itself. We find this case unique in that the reaction was localized to the area overlying the device, and with implantation of the device under the pectoralis as well as systemic steroid therapy, the GVHD resolved. We believe that it is important to include GVHD when cultures are negative and antibiotics have not subsided symptoms, especially in a patient who has undergone allogeneic hematopoietic cell transplantation. Chronic GVHD can happen at any time post hematopoietic cell transplantation.[8] In our review of the literature, we did not find any reported cases of GVHD that was caused by an ICD.

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