Successful Treatment of Multisystem Sarcoidosis with Use of a Tumor Necrosis Factor-Alpha (TNF-α) Inhibitor in an LVAD Patient

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INTRODUCTION

Sarcoidosis is an increasingly prevalent systemic disease resulting in granulomatous inflammation. Cardiac sarcoidosis (CS) can manifest as systolic heart failure (HF) and treatment with immunosuppressive agents is central to prevent adverse CV events. CS that progresses to advanced HF (AHF) may benefit from LVAD therapy to improve outcomes. TNF-α inhibitors are an established therapy for extra-cardiac sarcoidosis, though their role is unclear in CS, particularly given concerns of their use in heart failure.

CASE REPORT

A 41-year-old woman with biopsy-proven extra-cardiac sarcoidosis (with cutaneous, pulmonary, hepatic, neurologic and renal involvement) presented with systolic heart failure. 18-Fludeoxyglucose Positron Emission Tomography (FDG-PET) confirmed extensive lymph node and myocardium inflammation despite long-standing prednisone therapy. Cardiac Magnetic Resonance Imaging (C-MRI) confirmed mixed subendocardial, transmural and subepicardial gadolinium enhancement consistent with sarcoid involvement. The left ventricular ejection fraction was 28%.

A trial of methotrexate resulted in worsening renal and liver function requiring transition to azathioprine. Cardiomyopathy progressed to AHF requiring continuous milrinone support and eventual centrifugal flow LVAD implantation with tricuspid valve repair. Left ventricular core biopsy obtained during LVAD implantation confirmed non-necrotizing granulomatous inflammation consistent with cardiac sarcoidosis.

Three months post-LVAD implantation, repeat PET imaging confirmed failure of prednisone and azathioprine to reduce inflammation. The patient was subsequently started on adalimumab (a subcutaneously delivered TNF-α inhibitor administered every 2 weeks) with complete resolution of multisystem inflammation. Treatment was well tolerated with one presumed cellulitis episode empirically treated with antibiotics. There has been no evidence of worsening heart failure such as right ventricular compromise.

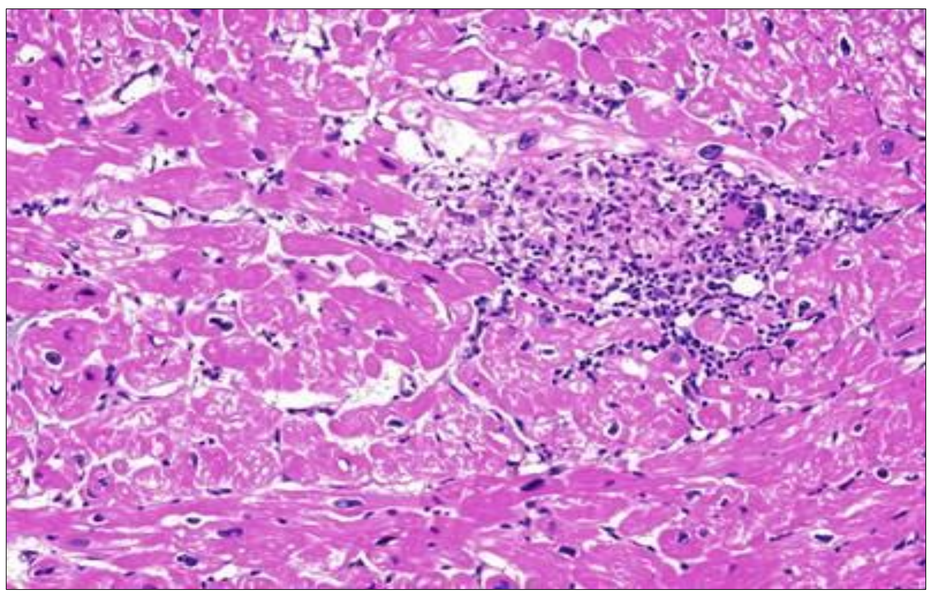

Figure 1: Endomyocardial biopsy confirming non-necrotizing granulomatous inflammation consistent with cardiac sarcoidosis.

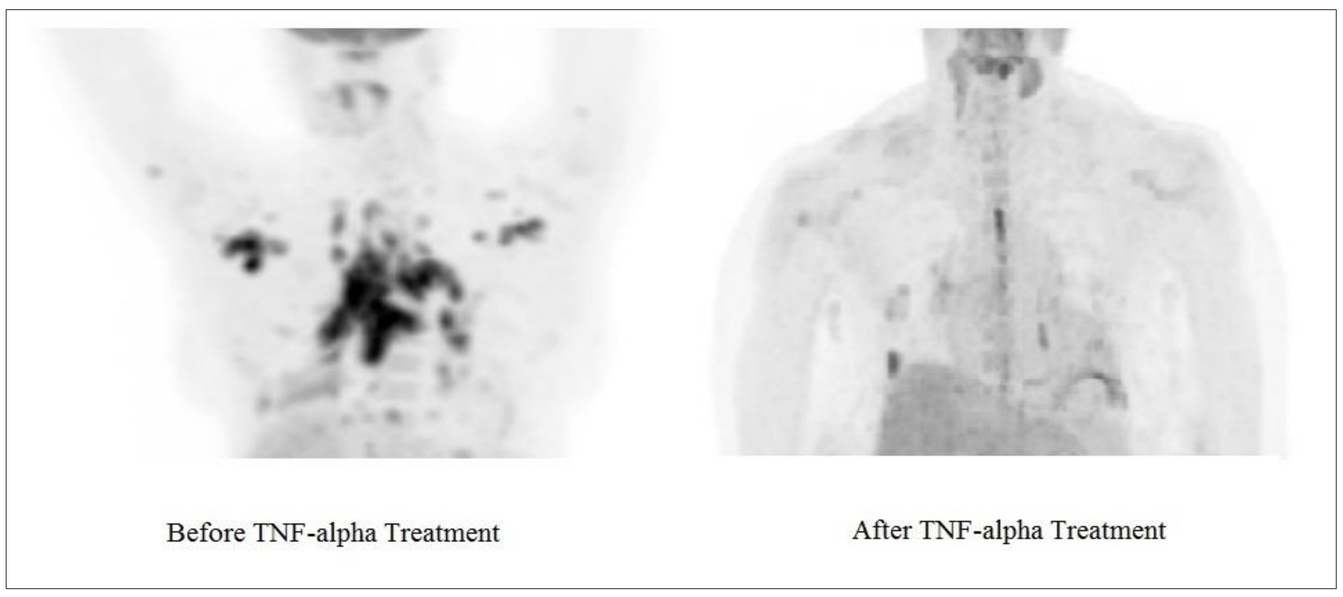

Figure 2: FDG-PET imaging demonstrates extensive lymph node and myocardium inflammation prior to TNF-α treatment, with resolution of inflammation following treatment.

SUMMARY

TNF-α inhibitors may be an alternative treatment for CS patients and should be considered in multi-organ sarcoidosis refractory to steroids and steroid-sparing immunosuppressive therapy. To our knowledge, this is the first report of active multi-organ sarcoidosis complicated by AHF requiring LVAD therapy to be successfully treated with a TNF-α inhibitor. Although TNF-α inhibitors have been associated with worsening heart failure, this case illustrates their utility in patients with AHF secondary to cardiac sarcoidosis, and warrants further investigation of these medications in this distinct patient population.

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