Lymphofollicular myocarditis: an unknown cause of terminal heart failure

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A 13-year-old girl was admitted in May 2007 to our hospital with severe heart failure (NYHA III), concomitant ventricular tachycardia, acute renal failure, and recurrent pleural effusions for further evaluation. The blood samples revealed thrombocytopenia (49 000 G/L) and lymphocytopenia (19%), and brain natrium peptide was increased to 2000 pg/mL. The electrocardiogram displayed unspecific repolarization abnormalities and echocardiographic evaluation revealed a dilated left ventricle with severely reduced contractility. Cardiac magnetic resonance imaging confirmed a severely depressed left ventricular function (EF 12%) and late gadolinium enhancement was indicative for the presence of inflammation and/or fibrosis in the interventricular septum. Magnetic resonance imaging-targeted right-sided biopsy of the interventricular septum presented histologically acute lymphocytic myocarditis. Despite an optimized therapy for heart failure, the patient deteriorated further. Six weeks later she underwent successful orthotopic heart transplantation. In September 2009, unforeseen, the girl died due to cardiac post-transplant lymphoproliferative disorders.

Histopathological evaluation of the explanted heart revealed an unexpected extensive multifocal inflammation with numerous structures corresponding to lymph folicles associated with extensive myocardial necrosis and fibrosis (Figure). The presence of a monoclonal cardiac B- or T-cell lymphoma as well as an infection of the myocardium with a great variety of cardiotropic viruses, bacteria, protozoa, and fungi was excluded by nested PCR/RT-PCR. Notably, morphologically comparable lymphoid folicles were described in the kidneys and lungs of maedia-visna virus-infected sheep, suggesting the involvement of a so far unidentified virus in human lymphofollicular myocarditis. This highly impressive new type of a lethal inflammatory cardiomyopathy should have an impact on immunologic research with respect to its yet unsolved aetiopathogenesis, considering also an underlying potential autoimmune disease.

Histological and immunohistological findings of the explanted heart. HE staining, lymphofollicular myocarditis; Masson trichrome staining, abundant necrotic myocytes and fibrosis. Immunohistochemical findings in lymphofollicular structures of consecutive heart tissue sections: typical areas of CD20+ B cells and CD3+ T cells, CD5+ cells (activated T cells and IgM secreting B cells), CD23+ cells (mature B cells, activated macrophages, follicular dendritic cells), CD68+ macrophages, Ki-67 (MIB-1)+ cells, indicative for reactive lymph folicles.