**DIFFERENTIAL REVERSIBILITY IN HEART FAILURE DUE TO HYPOTHYROIDISM**

**E.S. Roberto1**, T. Aung1, A. Agarwal1,2, R.J. Colon1

1. Wright State University Department of Internal Medicine, Dayton, OH, USA

2. Veteran Affairs Medical Center, Dayton, OH, USA

*Introduction*: Dilated cardiomyopathy due to hypothyroidism is unique for its potential reversibility following hormone supplementation. Thyroid hormone profoundly affects cardiac physiology and intracellular calcium regulation. Administration of levothyroxine can restore contractile function, however the scope and extent of reversibility remains unknown. The following cases describe dilated cardiomyopathy due to hypothyroidism, with different timelines and varying degrees of reversibility. The relationship between disease timeline and reversibility deteriorating into irreversibility in dilated cardiomyopathy due to hypothyroidism has not been previously described.

*Cases*: A 65-year-old Caucasian male presented with new onset severe dyspnea and fatigue over three months. The patient had a history of hypothyroidism. Thyroid-stimulating hormone was markedly elevated. Following levothyroxine therapy, the dilated cardiomyopathy reversed and returned to normal within six months. Left ventricular systolic function had improved from an ejection fraction of 15% at presentation to 45% at six months. A 60-year-old Caucasian female presented minimally responsive in overt heart failure due to myxedema coma. History revealed hypothyroidism chronically uncontrolled for years prior to presentation. TSH was significantly elevated. Following prolonged hospital admission and intravenous levothyroxine therapy, the clinical status began to improve. Left ventricular function improved from an ejection fraction of 10% to 25% after six months with measurable improvement in chamber diameters.

*Discussion*: In conclusion, the varying degree of recovery between these two cases suggests a temporal association between uncontrolled disease and extent of reversibility. Once the underlying mechanism of heart failure was addressed, the cases displayed varying degrees of restored contractile function following thyroid hormone replacement. This may suggest that with a longer duration of uncontrolled disease and consequent cardiac structural remodelling, the possibility and extent of reversibility diminishes into irreversibility. Earlier identification and treatment of any contributing hypothyroidism in the setting of new onset dilated cardiomyopathy is essential, as reversibility may be at stake.