**Title:** Mitral Annular Disjunction in Patients with Out-of-hospital Cardiac Arrests

**Background**: Mitral annular disjunction (MAD) is associated with risk of ventricular arrhythmia and cardiac arrest. MAD is the upward displacement of the annulus fibrosis into the left atrium, creating separation of the mitral valve leaflet from the left ventricular free wall. The prevalence of MAD has not been described in pediatric patients or young adults.

**Objectives**: The goal of our study is to quantify the prevalence of MAD in young patients (age <50 years) presenting with out-of-hospital cardiac arrest (OOHCA).

**Methods**: A retrospective chart review was performed at the tertiary referral academic medical center and children’s hospital in a single metropolitan area. Baseline, arrest, and follow-up characteristics were obtained for patients presenting with OOHCA. The presence and degree of MAD was determined by transthoracic echocardiogram images, utilizing the parasternal long-axis view, measuring the distance between the posterior valve leaflet and the ventricular free wall insertions at end-systole in accordance with published recommendations.

**Results**: There were 55 patients that met the inclusion criteria for OOHCA [58% male, median age 20 yrs (range 4-48 yrs)]. MAD was identified in 3 of 29 adult patients [67% male, median age 43 yrs (range 42-48 yrs)]. No pediatric patients were identified to have MAD. Ten patients had previously documented cardiac conditions (18%) and 25 patients were subsequently diagnosed with a cardiac condition after initial treatment of the arrest (45%). In patients with MAD, the median distance of annular disjunction was 8.3 mm (range 0.04-13.9 mm). Etiology of the OOHCA was cardiac in 15 (58%) children, 20 (69%) adults, and included QT syndrome in 5 (14%) and CPVT in 6 (17%). Of interest, 2 patients with MAD (67%) were diagnosed with suspected Long QT syndrome in the face of QTc prolongation and a genetic variant of unknown significance in the QT gene.

**Conclusions**: Mitral annular disjunction was not identified in any children age 3-18 years presenting with out-of-hospital cardiac arrest; however, 10% of young adults (age 19-49 years) were diagnosed with mitral annular disjunction following cardiac arrest. The presence of concurrent mitral annular disjunction and genetic long QT syndrome in patients with out-of-hospital cardiac arrest requires further study.