# A Complex Case of Mixed Phenotype Arrhythmias Associated with CACNA1C Mutation: Overlapping Features of Long QT Syndrome, Brugada Syndrome, and Timothy Syndrome

**Background**

A 32-year-old female with asthma, overactive bladder, GERD, IBS, migraines, and congenital pyloric stenosis presented with stroke-like symptoms. Despite normal CT and MRI, she reported a year-long history of palpitations and nocturnal episodes. Initial evaluation showed elevated blood pressure and heart rate, with an EKG revealing normal sinus rhythm, atrial ectopy, and frequent PVCs. Previous EKGs showed PACs linked to caffeine and albuterol use.

**Methods**

During hospitalization, she experienced atrial fibrillation with RVR, initially managed with diltiazem. Due to sinus pauses, Dofetilide was administered but later discontinued. Echocardiography showed a non-dilated LV with mild hypokinesis, EF of 50-60%, mild-to-moderate MR/TR, moderate pulmonary hypertension (PASP 56 mm Hg), and grade II diastolic dysfunction. Cardiac MRI indicated LVEF of 59% and RVEF of 58%, with nonspecific mid-wall myocardial fibrosis.

**Results**

Outpatient flecainide was halted due to GI side effects. She underwent pulmonary vein isolation and ablation, complicated by cardiac arrest but recovered without neurological deficits. During hospitalization, LVEF reduced to 25-30% with new +3 MR/TR. Genetic testing revealed a CACNA1C mutation. Follow-up showed EF recovery and improved well-being.

**Conclusions**

The case illustrates a complex phenotype associated with a CACNA1C mutation, involving features of Long QT Syndrome, Brugada Syndrome, and Timothy Syndrome. The prolonged QTc, arrhythmias, and congenital anomalies align with Timothy Syndrome, while cardiac arrest and atrial fibrillation suggest Brugada Syndrome. Management included antiarrhythmic medications, ablation, and genetic counseling, emphasizing the need for continuous monitoring and a multidisciplinary approach.

