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A significant EKG change suggesting acute coronary syndrome in a patient with Prinzmetal syndrome

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6³⁻ year- old female with history of hypertension, hyperlipidemia, SVT, palpitations, migraines, GERD, and anxiety who presented with shortness of breath and noted to have concerning acute ischemic changes on EKG with diffuse ST depression along with ST elevation in aVR. She was sent to hospital for further evaluation. In ED, physical exam is unremarkable, on cardiovascular RRR, normal S1 & S2; no murmurs, rubs or gallops. EKG showed sinus tachycardia with ST elevation at aVR and diffuse ST depression (Figure 1A). Transthoracic echocardiogram (TEE) demonstrated mild concentric hypertrophy of the left ventricle, grade 1 diastolic dysfunction and preserved LV ejection fraction of 55- 60%. Left heart catherization revealed normal coronary arteries and normal LV function (Figure 2) suspect coronary spasm. Patient was treated aggressively with amlodipine in addition of nitroglycerin and metoprolol. EKG abnormality was resolved.

Widespread ST-segment depression and ST-elevation in aVR would often suggest left main coronary artery or triple vessel disease 3,4 However, the negative angiogram suggesting coronary spasm – Prinzmetal Angina (PVA). PVA is caused by a transient reduction in blood flow through the coronary arteries due to vasospasm of the vessel. 1,2 PVA is often observed in young women with non-typical cardiovascular risk factors and may be associated with other conditions such as Raynaud's phenomenon and migraine headaches. 1 Diagnosis is made when transient ST-elevation is seen on electrocardiogram during an attack or from coronary artery angiography with use of provocative medications such as acetylcholine, ergonovine or methylergonovine to induce spasm of the vessel. 1,2,5

Unique Aspect: Significant EKG change with diffuse ST depression along with ST elevation in aVR could suggest left main artery spam. In an acute setting, this could increase rate mortality and morbidity (8). The treatment should be aggressive including the combination of calcium channel blockage, nitrate, beta blockage and risk factor modification.