Intriguing Rhythm in a patient with Left posteroseptal accessory pathway

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Introduction: Automatic impulse formation originates in cells with spontaneous diastolic depolarization, found in the sinus node, AV node, coronary sinus ostium, and crista terminalis. Abnormal automaticity may be unmasked after ablation that injures the cell and promotes spontaneous depolarisation. Abnormal automaticity is also seen in ligament of Marshall, atrial muscular sleeves into PV. Among pathways, atriofascicular pathway (likely to show spontaneous and ablation induced automaticity due to its structure like AV nodal tissue).

Methods: Hence we report a case of interesting wide QRS rhythm in a patient with left posteroseptal pathway.

Result: 36 years man with history of recurrent episodes of palpitations for last 10 yrs., increasing in frequency recently. Baseline ECG was suggestive of posteroseptal accessory pathway. EP study showed HV of 18 ms. Maximal preexcitation was suggestive of left posteroseptal accessory pathway. On ventricular pacing, retrograde conduction was mixed (through pathway and node), however during induced tachycardia, earliest A was in proximal CS, and His A was late. AV Wenckebach was at 240ms. Narrow QRS tachycardia was induced easily by atrial and ventricular extra beats. Tachycardia was suggestive of orthodromic AVRT, retrograde through posteroseptal accessory pathway. Entrainment from RV apex showed PPI- TCL= 108ms and SA-VA= 62ms. His refractory VPC pulled A with reset of tachycardia. After terminating the induced tachycardia by burst ventricular pacing, there was a wide QRS rhythm at rate of 160bpm was noticed instead of the expected sinus rhythm. The morphology of QRS was similar to preexcited rhythm and atrial activation which preceded the V was also same as the retrograde A activation during tachycardia. Further, there was QRS alternans and cycle length wobbling during the rhythm. During the alternans, there was alternate beats of QRS morphology same as maximal preexcitation (LV exit) and QRS morphology suggesting of posteroseptal exit into RV. There was AA wobble preceding the VV wobble. After some time, this rhythm slowed down and gave way to sinus rhythm. Transseptal access was done, and pathway was ablated successfully in left posteroseptal area. Thereafter there was no tachycardia or wide QRS rhythm induced.

Conclusion: In this case the rhythm can be due to the following possibilities: 1. Coronary sinus automaticity (as there was fragmentation of CS potentials on ventricular burst pacing). 2. Bypass tract automaticity (catecholamine was given to induce tachycardia, and this may increase automaticity) 3. Preexcited Atrial Tachycardia from near the atrial insertion of the pathway. However spontaneous bypass tract automaticity is uncommon in nondecremental pathways, and before ablation. The QRS alternans is suggestive of pathway exit into left and right ventricle, indicating complexity of posteroseptal space or the connections of musculature in CS to both ventricles.