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FIT Clinical Decision Making

RARE MANIFESTATION OF DUAL ATRIOVENTRICULAR NODE PHYSIOLOGY

Poster Contributions

Hall C

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Session Title: FIT Clinical Decision Making: Congenital and Electrophysiology

Abstract Category: Arrhythmias and Clinical EP

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Background: Simultaneous dual atrioventricular (AV) nodal conduction is a rare condition associated with non-reentrant AV nodal tachycardia. This phenomenon produces double irregular ventricular activation from a single atrial impulse that is often misdiagnosed as atrial fibrillation.

Case: A 58-year-old man was admitted with syncope which occurred while driving resulting in a motor vehicle accident. Patient reported several weeks of dizziness, tinnitus, and palpitations. Co-morbidities include hypertension, hyperlipidemia, and remote myocardial infarction. Patient was found to be tachycardic. Electrocardiogram (ECG) showed an irregular varying QRS morphology at 161 beats per minute (bpm), with regular P waves at 80 bpm with a P:QRS ratio of 1:2. An echocardiogram showed an ejection fraction of 35%.

Decision-making: Due to incessant tachycardia with this unusual pattern, an expedited electrophysiological study (EPS) was performed. As suspected, the atypical manifestation of dual AV node physiology was found with 2 ventricular complexes both preceded by His deflections resulting from a single atrial complex. An additional unusual finding was noted. Atrial pacing at lower rates induced 2:1 antegrade AV block; pacing at faster rates resulted in 1:1 conduction. This too can be explained by the extreme differences in refractory periods of the slow and fast pathways. Radiofrequency (RF) application in the slow pathway region resulted in immediate termination of the tachycardia, and a normalization of the antegrade conduction pattern during atrial pacing. A follow-up echocardiogram one month post ablation showed ejection fraction of 45% and patient noted marked improvement in functional capacity.

Conclusion: This case illustrates a very unusual case of simultaneous dual AV nodal conduction leading to tachycardia induced cardiomyopathy. Careful ECG evaluation and EPS are fundamental for the diagnosis of this condition. RF ablation of the slow pathway is curative and its diagnosis is critical to avoid inappropriate therapies for misdiagnosed atrial fibrillation.