

Interesting electrogram during electrophysiology study of a patient presenting with palpitation.

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25 year male with repeated episodes of palpitation and structurally normal heart was admitted for electrophysiology study. 12 lead electrocardiograph during EP study showed the following rhythm. ECG below is showing groups of 3 beats followed by a pause followed by initiation of narrow complex regular tachycardia. In a group first complex is narrow followed by a wide complex and then a narrow complex but with a prolonged PR interval. Then there is a pause before start of another group of 3 beats. So what the explanation for this type of rhythm ?

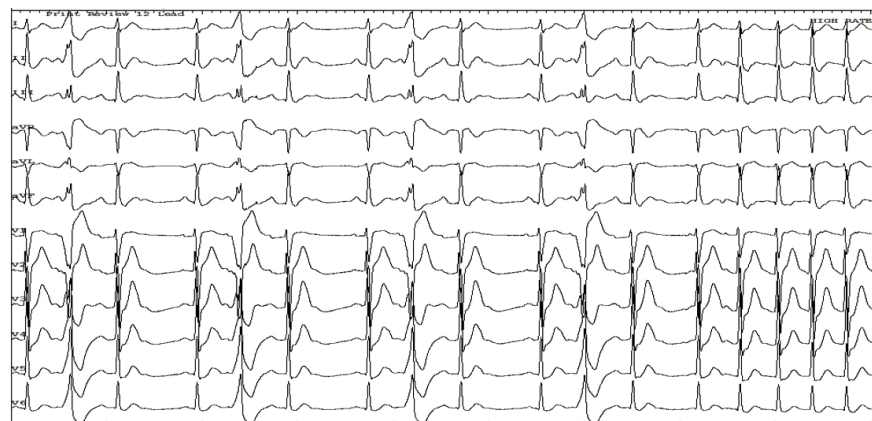


Figure 1 showing pattern of group beating followed by initiation of narrow complex tachycardia.

We put a decapolar catheter in coronary sinus, a quadripolar in HIS location. Below is the electrograms. Initial beat is a sinus complex with AH interval of 79 msec. Middle one is also sinus beat as P wave is of same morphology and atrial activation pattern are same as that of previous sinus beat, but it is a preexcited beat and HV interval is negative here. The third beat is also a sinus beat but conducting to ventricle with prolonged AH interval of 127 msec. So what is the mechanism of prolonged AH interval in the third beat? Most probably the preexcited beat is retrogradely activating the HIS because the AH interval in preexcited beat is less than that of sinus beat. The preexcited ventricular stimulus is penetrating AV node and resetting its refractoriness (concealed conduction)¹. By the time next sinus beat is reaching the AV node The HIS is in relative refractory period so it is conducting with prolonged AH interval.

Now what is the cause of pause after the third beat ? The third beat is producing an echo beat which is resetting the sinus node (Fig 3). Here the pause is incomplete (A1-A3 less than twice A1-A1). The response of sinus node to this extrastimulus is falling in zone II or zone of reset².

Orthodromic AVRT was induced and intermittent preexcitation was noticed. Earliest atrial signal during tachycardia was seen in His proximal signal suggesting parahisian pathway. Pathway successfully ablated from noncoronary cusp successfully and post ablation ECG showed sinus rhythm with no preexcitation.



Figure 2 showing electrogram .

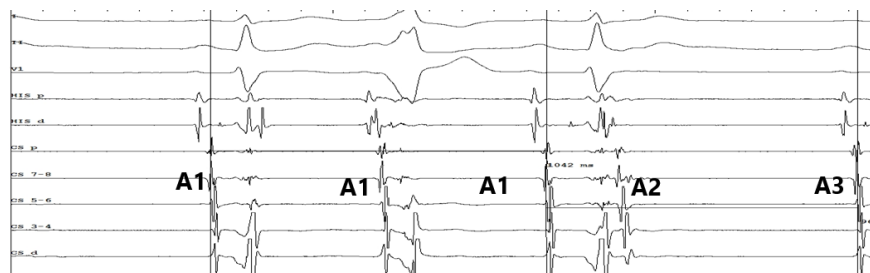


Figure 3 showing 2A1-A1=1042 msec and A1A3= 965 msec.

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