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ORIGINAL ARTICLE

Junctional rhythm occurring during AV nodal reentrant tachycardia ablation, is it different among Egyptians?

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KEYWORDS
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Abstract *Introduction:* Radio frequency ablation of the slow pathway has become first-line therapy for the elimination of AV nodal reentrant tachycardia (AVNRT). Slow pathway ablation is guided by a combination of fluoroscopic landmarks, electrogram morphology, and the induction of accelerated junctional rhythm (JR) during the application of radiofrequency energy. Although JR occurs usually during slow pathway ablation of AVNRT, the pattern of JR has not been adequately studied.[13]

Aim of the study: To investigate in detail the characteristics of junctional rhythm occurring during radiofrequency ablation of atrioventricular nodal reentrant tachycardia AVNRT among Egyptians.

Methods: This study included 30 patients who underwent electrophysiological study for narrow complex supraventricular regular tachycardia which revealed to be AVNRT.

Results: Thirty (100%) patients showed induction of junctional rhythm at the successful ablation sites. JR was a very sensitive predictor of successful ablation but not so specific with specificity of 60%. Sex patterns of JR were observed. The most common pattern of JR was Sinus-junctional–junctional (SJJ) while Sinus-junctional-block (SJB) was the least. The most specific pattern for effective ablation was junctional–junctional–junctional (JJJ), while intermittent burst was the least.

Abbreviations: AV, Atrioventricular; AVNERP, Atrioventricular nodal effective refractory period; AVNRT, Atrioventricular nodal reentrant tachycardia; CL, Cycle length; EP, Electrophysiologic; HRA, high right atrium; JJJ, junction junction junction; JR, Junctional rhythm; RF, Radiofrequency; SJB, Sinus junction block; SJJ, Sinus junction junction; WCL, Wenckbach cycle length

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P value is 0.001 i.e. highly significant.
Conclusion: Junctional rhythm is a sensitive predictor of successful ablation. The pattern of JR is a useful predictor of successful ablation. Egyptian population has distinctive patterns of JR during AVNRT ablation.

1. Background

Atrio-ventricular nodal reentrant tachycardia (AVNRT) is the most common type of reentrant supraventricular tachycardia (SVT). It involves an additional accessory pathway through the AV node that becomes a reentry circuit causing the tachycardia.[1]

It is the operative mechanism in up to 60% of patients presenting with paroxysmal supraventricular tachycardia.[4]

Radiofrequency ablation of the slow pathway has become the first-line therapy for the elimination of AV nodal reentrant tachycardia (AVNRT). Slow pathway ablation is guided by a combination of fluoroscopic landmarks, electrogram morphology, and the induction of accelerated junctional rhythm (JR) during the application of radiofrequency energy. Although JR occurs usually during slow pathway ablation of AVNRT, the pattern of JR has not been adequately studied.[13]

[1.1] *Aim of the study and hypothesis*

To investigate in detail the characteristics of junctional rhythm occurring during radiofrequency ablation of atrioventricular nodal reentrant tachycardia AVNRT among Egyptians. We hypothesized that adequate analysis of JR occurring during ablation of AVNRT may be used as a predictor for successful ablation and it may have a special pattern among Egyptians.

2. Methods

2.1. Study population

The preceding hypothesis was tested prospectively among 30 patients who demonstrated tachycardia suggestive of AVNRT during EP study presented to our lab.

2.2. Electrophysiology study

The EP studies were performed using quadripolar recording electrodes positioned at high right atrium (HRA), bundle of His (His), and right ventricular apex after obtaining informed consent. The surface electrocardiographic recordings and intracardiac electrograms were continuously recorded on a digital recording system. The intracardiac electrograms were filtered at 40 and 500 Hz and displayed with amplifier settings of 0.5–1.0 mV. Burst with/without extrastimulus atrial and ventricular pacing were used to induce supraventricular tachycardia. Intravenous isoproterenol or atropine was administered if tachycardia was noninducible or nonsustained at baseline. Tachycardia characteristics were analyzed after a sustained episode occurred spontaneously or by induction. Adequate study after induction was done to diagnose type of tachycardia and ensure AVNRT exists to be included in the study.

2.3. Ablation

Ablations were performed with 4-mm tip radiofrequency ablation catheters. Power delivered was titrated from 20 to 50 W with a temperature limit of 55 °C based on AV conduction, V–A conduction, and the presence of junctional beats. The ablation end points were the absence of inducible or spontaneous clinically relevant tachycardias. When more than a single AV nodal echo beat was present, further ablation was done in patients with AVNRT.

2.4. Follow-up

The 12-lead electrocardiograms were obtained in all patients at follow-up of 1–2 months after the ablation procedure. Further clinical follow-up or event monitoring was performed only if patients reported recurrent symptoms.

2.5. Statistics

This was done using SPSS software, version 9.02, 1998, Echosoft Corporation, USA. The goodness of fit test was done to determine the distribution of data. Descriptive statistics in the form of mean ± SD were calculated for the normally distributed parameters. On the other hand, values of the skewed parameters were expressed as median and interquartile range.

3. Results

This study included 30 patients who underwent electrophysiological study for narrow complex supraventricular regular tachycardia which revealed to be AVNRT. The mean age of the studied group was (45.27 ± 11.25 years), 12 patients were males (40%) and 18 patients were females (60%). Most of them were complaining of rapid palpitation.

93% of the study population (28 patients) showed normal resting ECG while 7% (2 patients) had nonspecific ST-T wave changes in their resting ECG.

While during tachycardia; the average heart rate was 176 ± 22 bpm. ST segment elevation in lead aVR was noticed in only two patients 6.7%. Pseudo-s wave could be seen in 9 cases (30%) while Pseudo-r wave was seen in only one patient (3.3%).

The average duration of the procedure was 64.67 ± 13.95 min (ranged from 45 to 100 min). While the average fluoroscopic time was 32.4 ± 10.21 min (ranged from 15 to 60 min.).

The mean SCL before ablation was 710 ± 118.4 ms (ranged from 480 to 940 ms). The mean PR interval before abla-