Radiofrequency Catheter Ablation of AVNRT

Written by Toni Rizzo

Claus Schmitt, MD, Medizinische Klinik IV, Städtisches Klinikum Karlsruhe, Karlsruhe, Germany, discussed practical strategies for radiofrequency (RF) catheter ablation of atrioventricular nodal reentry tachycardia (AVNRT), including slow and fast pathway ablation. Prof. Schmitt prefers a 3-catheter setting using the slow pathway. Using this technique, many interventionists start from a left anterior oblique (LAO) projection; in this position, a His bundle potential can be recorded simultaneously with the catheter in the His position.

To target the slow pathway, interventionists may use an anatomic approach, an electrogram-guided approach, or an integrated approach. Prof. Schmitt prefers the latter. A typical setup is a His bundle recording with a coronary sinus catheter and an ablation catheter. Isoproterenol is used if the patient can not be induced and to determine success of the ablation. Use of sedation may increase vagal tone and make it difficult to induce the arrhythmia. In noninducible patients, if there are no accessory pathways after tachycardia and there is documented supraventricular tachycardia (SVT) that is compatible with AVNRT, Prof. Schmitt recommends continuing with the ablation.

Slow pathway ablation typically is performed in sinus rhythm, starting from LAO or right anterior oblique projections using 20 to 30 watts for up to 60 seconds to reach >50°C. If there are many junctional beats (Figure 1) at the start of RF application, Prof. Schmitt paces the atrium to determine if the fast pathway is intact. It is best to stop at 60-second intervals if the fast pathway is compromised. Accelerated junctional rhythm occurs in almost 100% of effective sites but also in up to 65% of ineffective sites.

Figure 1. Start of Ablation: Junctional Beats.

Reproduced with permission from C. Schmitt, MD.

Official Peer-Reviewed Highlights from the

Heart Rhythm 2012
33rd Annual Scientific Sessions

A successful ablation can be proved by noninducibility with or without isoproterenol. In a complete ablation of the slow pathway, there is no jump or echo beat. If the slow pathway is modified, it is acceptable to have a jump and up to 1 atrial echo beat. During RF ablation in atypical AVNRT, the slow pathway is mapped during tachycardia.

Some studies have reported that fast pathway ablation is an acceptable approach in patients with AVNRT and a prolonged PR interval [Reithmann C et al. *J Cardiovasc Electrophysiol* 2006]. There might be more than 1 slow pathway; however, and if care is taken, slow pathway ablation can be safe.

Prof Schmitt's laboratory reported a 98.8% acute success rate with a recurrence rate of 5.2% [Estner HL et al. *Pacing Clin Electrophysiol* 2005]. Complications, such as late AV block with RF lesion extension, have been reported in up to 0.4% of patients. The Cryoablation versus Radiofrequency Energy for the Ablation of Atrioventricular Nodal Reentrant Tachycardia study [CYRANO] [Deisenhofer I et al. *Circulation* 2010] reported that AVNRT recurrence is more frequent with cryoablation versus RF ablation (9.4% vs 4.4%; p=0.029).

Cryoablation of AVNRT

Luc Jordaens, MD, PhD, Thoraxcentre, Rotterdam, The Netherlands, discussed cryoablation versus RF for AVNRT. In RF ablation, the interventionist must look for accelerated junctional rhythm during the procedure. Testing is repeated after each site or after occurrence of junctional rhythm. Fluoroscopy is used throughout the application. Junctional rhythm never occurs with cryoablation. Cryoablation is started with ice mapping at -30°C. If disappearance of the atrium-His (AH) jump is not feasible, the operator attempts to determine within the minute of mapping if a noninducible AVNRT occurs. If noninducible AVNRT is present without damage to the fast pathway, the temperature can be decreased to -80°C for complete ablation. Progressive AH lengthening can be checked with atrial extrastimuli; if AH jump is absent, then the ablation can continue. Cryoablation can be used to create a reversible lesion or a complete heart block.

An analysis of several studies that compared long-term outcomes of cryoablation versus RF showed acute success rates of 93% versus 96% and recurrence rates of 10% versus 4.2%, respectively [Schwagten B et al. *Europace* 2010]. Median procedure times were similar, but fluoroscopy times were lower with cryoablation.

AVNRT cryoablation is safe in the long term. Mapping capabilities are unique, and it can be used after prior cryoablation or RF ablation. Inducibility is not required if dual conduction is present. Absence of echo beats predicts long-term success. Prof. Jordaens concluded that there is no real need for RF ablation.

Official Peer-Reviewed Highlights from the

Heart Rhythm 2012
33rd Annual Scientific Sessions