Catheter ablation: is it good for all postinfarction ventricular tachycardias?

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A widespread application of these rules, however, has several important implications. The implantation of an ICD is not a curative approach; the risk of arrhythmia recurrence remains unaltered by the intervention, and frequently repeated shocks are a cause of significant discomfort, which reflects on decreased patient acceptance of the device and a lower quality of life[1].

The occurrence of arrhythmic storms, furthermore, may pose a significant threat to the patient’s cardiac status and, sometimes, even survival[4]. For all the abovementioned reasons, the need for a curative approach, such as that potentially offered by catheter ablation, is felt as an important goal by those electrophysiologists who are frequently involved in the management of patients with VT. As recently published in this Journal, catheter ablation performed using a single catheter approach based on conventional activation mapping and pacing techniques, frequently associated with concomitant administration of antiarrhythmic drugs, can offer a reasonable rate

of success over the long term in patients presenting with recurrent haemodynamically tolerated VT following a myocardial infarction[5]. It has been shown that the overall sudden death and cardiac death rates reported are comparable to those achieved in patients treated exclusively by an ICD. A definite statement of whether catheter ablation and antiarrhythmic drug (amiodarone) treatment can be used as an alternative to ICD in this subgroup of patients, however, cannot be made until firmly proven by a dedicated study.

The possibility of a more widespread application of catheter ablation to patients suffering from post-infarction ventricular tachycardia is further supported in the paper by O'Donnell[6] and colleagues published in this issue. The authors report their interesting and valuable experience in a consecutive population of very symptomatic patients suffering from frequent attacks of VT. The high long-term success rate achieved in these series appears even more remarkable in the view of the heterogeneity of the clinical presentation of the patients included: untolerated VTs were relatively frequent (29% of the population) and multiple morphologies had been almost invariably (83%) documented or induced. In the authors’ experience, the success rate was higher among those patients presenting with one clinical and inducible morphology; on the other hand, the outcome was poorer in the presence of three or more morphologies, particularly in the occurrence of untolerated arrhythmias. In this regard, there are several technical issues that should be addressed when catheter ablation of VT is considered.

(1) Pleomorphism is a peculiar feature of the arrhythmogenic substrate in patients with a prior myocardial infarction. While the number of spontaneously occurring and electrocardiographically documented morphologies is related to the number of antiarrhythmic drug treatments and also to the duration of the arrhythmia history (i.e. the higher the number of VT episodes, the higher the likelihood of multiple morphologies)[7], the number of induced VT morphologies is directly related to the number of induction attempts, of stimulation sites and of extrastimuli. Antiarrhythmic drugs[8], as well as surgical treatment[9], are less effective in patients with multiple VT morphologies; the data from O’Donnell and colleagues seems to support this; likewise, catheter ablation results are poorer in this group of patients. It is not clear, however, whether the number of induced VT morphologies that can be related to the stimulation protocol carries the same adverse significance both on acute procedure results and on long-term outcome. A study aimed at obtaining this information would be necessary.

(2) Complete arrhythmia suppression was not necessary to achieve the low VT recurrence rate observed in the reported study. A ‘modified’ result, defined as a change in induction requirements of two or more extrastimuli, was achieved in 34% of the patients; there was no relation of this procedure outcome to the clinical presentation (numbers of VTs, haemodynamic tolerance). The authors suggest that this ‘could be considered to be due to the antiarrhythmic effects of the ablation’, this being supported by the low VT recurrence rate (4%) among patients with a modified result. These data differ greatly from those reported in the majority of similar studies, where it can generally be appreciated that persistent arrhythmia inducibility is related to an increased risk of VT recurrence as compared to complete arrhythmia suppression[10,11]. It is indeed our policy, even in patients with tolerated VT, to implant an ICD in all patients in whom even non-clinical VTs are persistently inducible after even extensive ablation attempts.

The extremely aggressive stimulation protocol adopted by O’Donnell and colleagues in the study may explain the observed differences, because in most of the EP laboratories no more than three extrastimuli are used from multiple sites.

(3) The authors have reported a low usage of advanced mapping techniques, such as the CARTO electroanatomic or the Endocardial Solution non-contact mapping system, this implying that in the earlier years conventional mapping techniques had been used to attempt ablation of untolerated VTs. In patients presenting with untolerated VTs, conventional single catheter activation mapping and pacing techniques can yield a satisfactory acute and long-term success rate, provided that no other forms of unstable and/or haemodynamically tolerated VT are inducible. In this situation a precise definition of the arrhythmogenic substrate and of the many possible pathways potentially able to sustain a ventricular tachycardia is pivotal to guide a successful procedure[12,13]. When attempting, on the other hand, catheter ablation in patients with multiple VTs, including unstable and untolerated forms, the use of a three-dimensional system should become a standard approach.

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