



Contents lists available at ScienceDirect

Indian Pacing and Electrophysiology Journal

journal homepage: www.elsevier.com/locate/IPEJ

High density mapping of inappropriate sinus tachycardia further looks into potential mechanisms

Philippe Maury, MD^{*}, Anne Rollin, MD, Benjamin Monteil, MD, Pierre Mondoly, MD, Stefano Capellino, BE¹

Division of Cardiology, University Hospital Rangueil, Toulouse France

ARTICLE INFO

Article history:

Received 26 March 2017

Received in revised form

27 May 2017

Accepted 29 May 2017

Available online xxx

Keywords:

Inappropriate sinus tachycardia

High-density mapping

Radio-frequency ablation

ABSTRACT

Inappropriate sinus tachycardia (IST) is an incompletely understood condition associating unexpectedly fast sinus rates and debilitating symptoms whose management by sinus node modification/ablation demonstrated limited long-term success. We report about a case of IST who underwent two RF procedures using high density mapping system, highlighting some possibly specific features and discussing potential mechanisms.

Copyright © 2017, Indian Heart Rhythm Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Inappropriate sinus tachycardia (IST) is an incompletely understood condition associating unexpectedly fast sinus rates and a spectrum of debilitating symptoms including palpitations, weakness, fatigue, dizziness or near syncope [1]. Because of the relative incapacity of drug therapy in alleviating symptoms and reducing heart rate [1], sinus node modification/ablation by percutaneous RF (radio-frequency) ablation is sometimes proposed in disabled refractory patients, although often with limited long-term success [1–4]. This is probably due to a very incomplete knowledge about the mechanisms involved, but also possibly because of the limited precision in conventional electro-anatomical mapping.

Mechanisms involved in IST are still uncertain and probably multifactorial. Main hypothesis rely on mild dysautonomia, intrinsic elevated sinus node rate, hypersensitivity to catecholamines or M2 receptor blockade, still poorly known circulating mediators or neuropeptides, acquired structural alterations of the sinus node or psychiatric causes (see review in 1).

Detailed 3-dimensional mapping helps to identify earliest endocardial activation sites during IST, which are located all along the high crista terminalis area [1,3], which can be interpreted as the

endocardial activation breakthroughs from the underlying anatomically subepicardial sinus node. Extended ablation in these areas usually lead to more and more inferior shifts of the activation source, together with changes in P wave morphology and progressive reduction in heart rate [1–3] evoking diffuse electrophysiological alterations. In other cases however, discrete localized lesions lead to an abrupt reduction in heart rate [1,2,5] with similar P wave changes [4], evoking more focally localized abnormal automaticity.

The Rhythmia systemTM (Boston Scientific, Inc.) is a useful tool for achieving very detailed atrial activation [6]. If high-density mapping is helpful in increasing knowledge about the mechanisms of IST is unknown. We report about a case of IST who underwent two RF procedures using the Rhythmia systemTM, highlighting some possibly specific features and discussing potential mechanisms.

A 45 years-old woman with IST was referred because of intractable symptoms (palpitations and shortness of breath for minor exertion without any other cause). Symptoms lasted for several years despite repeated trials of single or associated drug therapy (nadolol 120 mg, verapamil, ivabradine 15 mg, diltiazem 200 mg daily). Mean heart rate was 108 bpm (diurnal 117, nocturnal 96, max 177, min 71) on ambulatory recording. Diagnosis of IST was made according to the consensus criteria [1,7] with exclusion of other causes. The patient had no other relevant medication and did not present with other comorbidities or mental health disease

^{*} Corresponding author. Cardiology, University Hospital Rangueil, 31059 Toulouse Cedex 09, France.

E-mail address: mauryjphil@hotmail.com (P. Maury).

Peer review under responsibility of Indian Heart Rhythm Society.

¹ Boston Scientific, France.

<http://dx.doi.org/10.1016/j.ipej.2017.05.007>

0972-6292/Copyright © 2017, Indian Heart Rhythm Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

outside some mental distress due to the long lasting debilitating symptoms linked to IST (not present before). While sinus node modification is not recommended as a part of routine care for patients with IST [7], we choose to perform sinus node ablation/modification because of intractable symptoms despite optimal medical therapy.

A first ablation procedure was performed. Electro-anatomical

map of the right atrium was created using the Rhythmia system™ with the Orion catheter, which is a mini-basket catheter made of eight splines with eight 0.4 mm electrodes each (64 electrodes, 2.5 mm spacing). Activation map showed multiple areas of earliest activation along the sinus node area, crista terminalis and anterior parts of the superior vena cava opening (Fig. 1) unchanged after autonomic blockade. Ablation was delivered using irrigated 4 mm

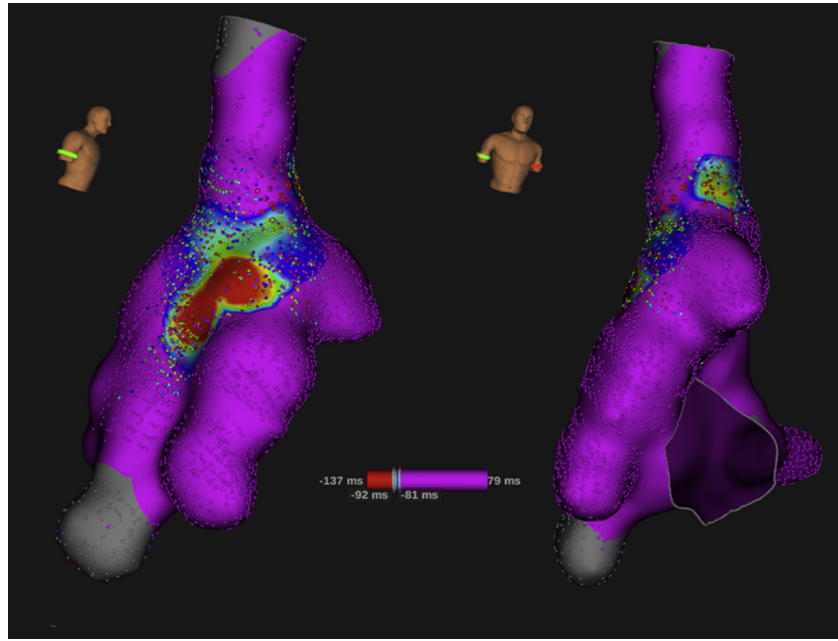


Fig. 1. Activation map during the first ablation procedure. Areas of earliest activation (in red) were rather diffuse, located along the sinus node area, crista terminalis and anterior parts of the superior vena cava (the window of activation scale is restricted to around 10 ms for better delineation of the earliest sources).

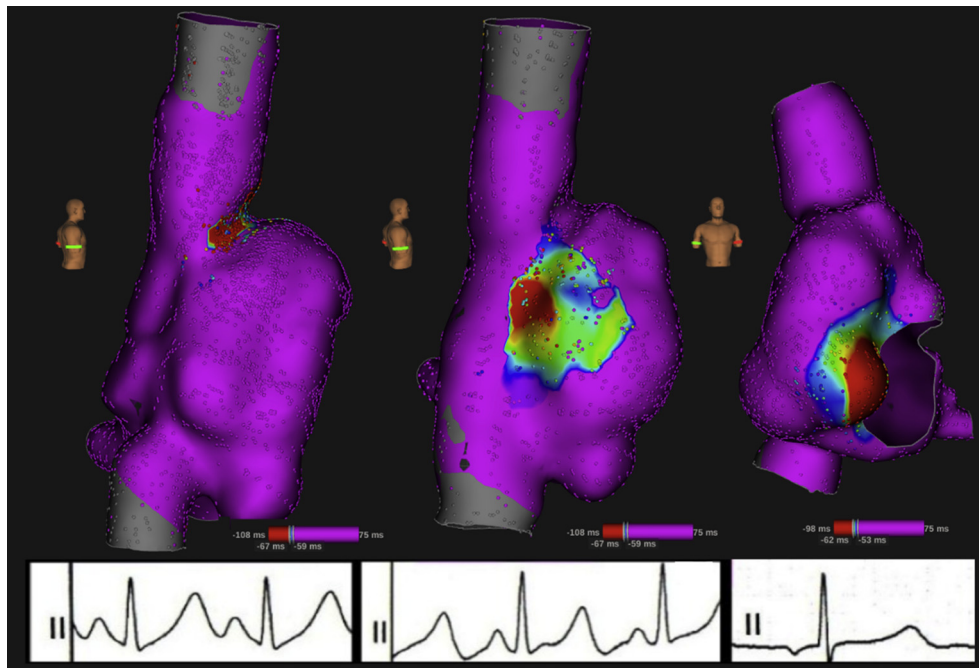


Fig. 2. Activation maps during the second ablation procedure. Areas of earliest activation (in red) were much more localized, initially located at the arcuate ridge (A), then slightly inferior (B) and then at the infero-lateral part for the tricuspid annulus (C), together with changing rates and P wave morphologies (see text) (the window of activation scale is similarly restricted to 10 ms). Note that automatic annotation with the Rhythmia system sometimes led to apparently inconsistent maps due to the recording of large number of points, some being incorrectly annotated (points of different colors in areas with the same activation time). But due to the high number of points, only the “dominant” local activation time is depicted as a background color on the map, avoiding the need to check and reannotate all points in case of clear mechanism.

Download English Version:

<https://daneshyari.com/en/article/5604034>

Download Persian Version:

<https://daneshyari.com/article/5604034>

[Daneshyari.com](https://daneshyari.com)