

Remote Cardiac Navigation with Carto Integration

a report by
Nadir Saoudi

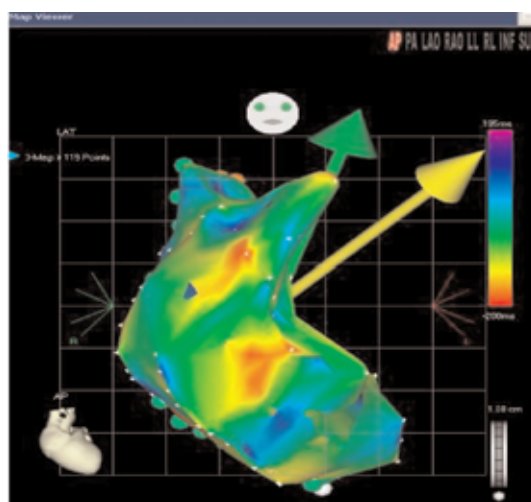
Professor of Cardiology, Centre Hospitalier Princesse Grace



Nadir Saoudi is professor of cardiology at the Centre Hospitalier Princesse Grace. He is former President of the French Arrhythmia Group of the French Society of Cardiology, a Fellow of the European Society of Cardiology, Fellow of the American College of Cardiology, member of the Heart Rhythm Society and a member of the European Heart Rhythm Association. He was previously professor of cardiology at the Centre Hospitalier et Universitaire de Rouen. Dr Saoudi graduated from the Faculté de Médecine de Créteil at Paris Val de Marne University.

The availability of remote navigation by mean of two permanent magnets – the positions of which are computer controlled – has started a new era in cardiac electrophysiology and radiofrequency catheter ablation.¹ When located close to the thorax in navigate position, both magnets create a relatively uniform magnetic field (0.08-T) of approximately 15cm inside the chest of the patient. The distal smooth tip of the mapping/ablation catheter is loaded with three small permanent magnets that will align with the direction of the externally controlled magnetic field, thus steering it effectively.² A set of coloured arrows symbolise the current (yellow) and future (green) magnetic fields and are displayed superimposed on two chest X-rays in oblique incidences or within a template (Navigant screen). As a growing number of ablations are now performed using computerised systems, such as Carto™, the combination of the latter with remote navigation was a logical and expected evolution.³ Recently released, the Carto RMT System has been specifically designed to combine the accurate real-time location of the Carto XP System the enhanced navigation capabilities of the Niobe System (see *Figure 1*). The System has a distinctive opening screen, and incorporates new features. These include a ‘Click-and-Go’ option that allows marking a specific location on the map and immediately transmission of this information to the Navigant Software. The latter will then create a succession of magnetic fields and push/pull of the Navistar catheter that allows it to reach the desired target. It also includes design lines that allows editing and creation of various lines shapes, which are then exported to the Navigant Software. The 3D surface images are

Figure 1: Antero-posterior Carto Map of the Right Atrium



Coloured arrows representing magnetic fields are superimposed on the map.

fused with the corresponding heart chamber as pre-operatively acquired from a computerised tomographic scanner. The latter is automatically copied to the Navigant Software and realtime catheter magnetic navigation is done within the scanner thus providing a remarkable live simulation to the physician.

This has shown to be useful in a clinical situation in which precise catheter positioning is difficult to obtain with classical means, as well as during the teaching or training period of young cardiologist or beginners in the field.^{1,2} The combination of the Carto system with remote navigation will create a safer and more efficient environment for both the patient and the physician, as precision will increase while fluoroscopy time will be reduced. ■

References

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2. Tops LF, Bax JJ, Zeppenfeld K, et al., “Fusion of multislice computed tomography imaging with three-dimensional electroanatomic mapping to guide radiofrequency catheter ablation procedures”, *Heart Rhythm* (October 2005);2(10): pp. 1076–1081.