

Image integration of cine-angiography with 3D electroanatomical mapping. Atrial flutter ablation with CARTO UniVu™ module support

Zintegrowanie systemu elektroanatomicznego 3D z obrazem fluoroskopowym w czasie rzeczywistym. Wstępne doświadczenia z modułem CARTO UniVu™

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Radiation exposure during cardiac electrophysiological procedures is still a major concern. Until now reduction of fluoroscopy time and dose during ablation procedures was achieved mostly through the use of three-dimensional (3D) electroanatomical systems. For more effective radiation exposure control and improvement of ablations results Biosense Webster created new 3D non-fluoroscopic navigation system software. The CARTO UniVu™ module of CARTO® 3 system allows real-time electroanatomical localisation of ablation catheters in pre-recorded X-ray images. Other technical details of this module were described previously. Here we report the first Polish experiences with mapping and ablation of typical atrial flutter performed with support of a CARTO UniVu™ module. Under fluoroscopy control, two diagnostic catheters were placed — one in the right ventricle apex position (quadripolar, nonsteerable, CRD, SJM) and the second, a 10-polar, steerable catheter (Inquirer, SJM), in the coronary sinus. For electroanatomical mapping and ablation the Thermocool® SmartTouch™ catheter (Biosense Webster, Inc., Diamond Bar, CA, USA), which also allows measurements of catheter contact force, was chosen; 41 s and 12 mGy fluoroscopy for diagnostic catheter positioning was used. Afterwards, with the CARTO UniVu™ module, the reference fluoro frame at the standard right (RAO 30°) and left (LAO 60°) anterior oblique projections was captured (Fig. 1). We terminated the arrhythmia during the ablation of the cavotricuspid isthmus (CTI), and we created a bidirectional block after a total procedure time of 50 min. The total fluoroscopy time was 50 s, with a total fluoroscopy dose of 15 mGy. Ablation of CTI is recommended in the treatment of typical atrial flutter. During the procedure, the ablation catheter is typically guided by conventional fluoroscopy. Nevertheless, a non-fluoroscopic or low-fluoroscopic approach is preferable. Here we demonstrated the feasibility and safety of the CARTO® 3 system with a UniVu module. Using this software combined with a contact force ablation catheter, a reduction in fluoroscopy ablation time to 10 s was possible. Decreasing the fluoroscopy time by CTI ablation was also shown with other systems. Using 3D navigation tech-

niques in pre-recorded 2D fluoroscopy — MediGuide technology — allowed a decrease in total fluoroscopy time of up to 2.5 ± 2 min in 10 consecutive patients. Ablation with remote magnetic navigation decreased the fluoroscopy time by up to 7.2 (3.2–12.2) min in series data. There are published experiences with a CARTO 3 UniVu module in the ablation of atrial flutter. In 58 patients a significant reduction in radiation exposure time was observed, from 8.6 ± 0.8 min, with a CARTO® 3 to 2.9 ± 0.3 min with a CARTO UniVu™. The authors emphasise that fluoroscopy reduction was achieved without prolongation of the procedure time.

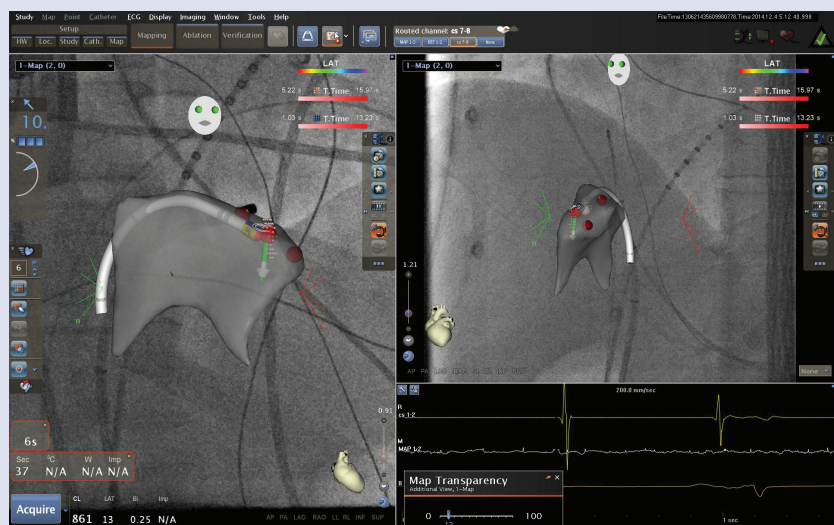


Figure 1. Standard RAO 30° and LAO 60° projections with placed diagnostic catheters captured during cavotricuspid isthmus (CTI) ablations with support of a CARTO® 3 with a CARTO UniVu™ module and Thermocool® SmartTouch™ ablation catheter

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