Combination of the pulsed field ablation with the EnSite Precision cardiac mapping system in the treatment of atrial fibrillation

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Atrial fibrillation (AF) is one of the most commonly encountered heart conditions. The prevalence of AF is expected to double in the next few decades [1]. Catheter ablation is beneficial in symptomatic patients with recurrent paroxysmal or persistent AF [2]. Due to growing demand and development of techniques, the number of procedures is increasing. One of the newest, recently introduced, catheter ablation methods is pulsed field ablation (PFA), which, despite many advantages, also has drawbacks, such as higher X-ray exposure.

A 63-year-old female with a history of paroxysmal AF underwent pulmonary vein isolation using both FARAPULSE™ PFA System and EnSite Precision™ under deep sedation. During the procedure, a single transseptal puncture was performed with subsequent rotational angiography. The map was obtained while maneuvering the FARAPULSE catheter integrated into the EnSite system. Four applications were delivered to each pulmonary vein with the basket-shaped catheter and another four with the flower-shaped catheter. Additional lesions between the veins were treated. After isolating all of the veins, a remap was performed to confirm entrance block (Figure 1). Exit block was confirmed with pacing. The procedure was free of complications, and the patient was discharged home on the following day.

The described case is the first case in Poland in which a specific additional EnSite software dedicated to the FARAPULSE system was used. This novel approach enabled the identification of the exact places of ablation and better entrance block confirmation due to the performed electroanatomical map performed after ablation. Moreover, it meets the requirement of using as low X-ray exposure as reasonably achievable. In this case, the rationale behind using a combination of two systems was to start using them in clinical practice and be ready to employ them in other clinical scenarios with definite indications for mapping and PFA ablation.

Unlike the earlier techniques of cryoablation or radiofrequency ablation, we utilized a newer form of energy delivery — PFA, which is thought to be a non-thermal ablation that applies short-duration high-voltage electrical fields to ablate the myocardial tissue with high selectivity and durability [3]. Success during PFA procedures depends on the proximity of the electrode to the target tissue, but not necessarily on contact. A unique feature of PFA is tissue specificity. The myocardium is very susceptible to irreversible injury whereas the collateral organs are relatively resistant to injury. So far, the times of PFA-based procedures turned out to be shorter when compared with radiofrequency and cryoablations [4]. The integration with the EnSite Precision™ 3D heart mapping system allows for the creation of 3D maps of the atrium with pulmonary veins based on the individual anatomy of the patient's heart. The use of the EnSite Precision™ mapping system was associated with improved periprocedural outcomes [5].

Currently, research is being conducted on the clinical effectiveness of integration of the PFA system with electroanatomic systems. Due to the innovative nature of this combination, there are currently few publications on the topic. Considering the numerous benefits, such as reduced fluoroscopy and

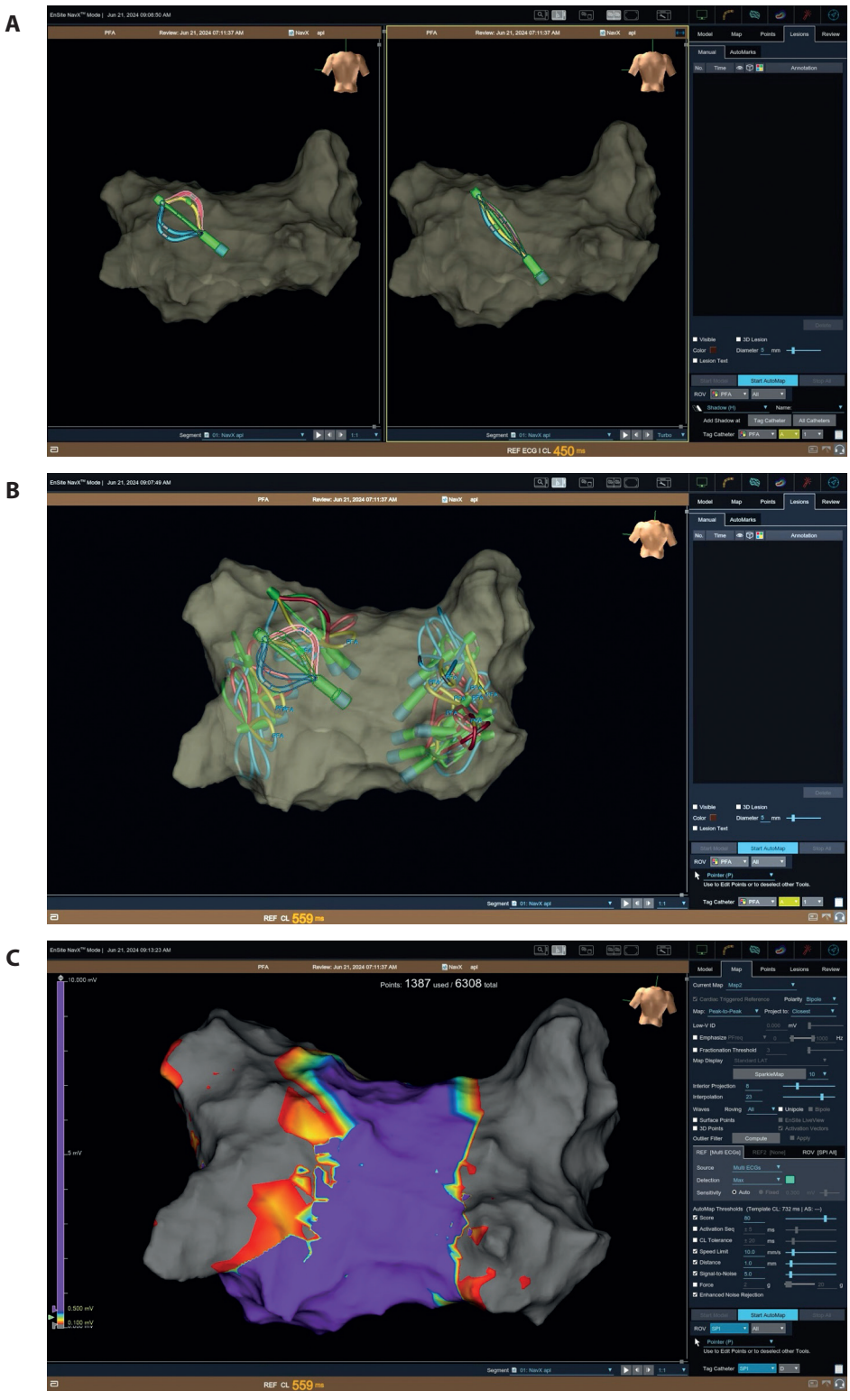

Figure 1. A. Electroanatomical map presenting catheter position in real-time. **B.** Periprocedural electroanatomical maps showing the places and shapes of application in the atrium. **C.** Posteroanterior view of the electroanatomical map performed after ablation

precise localization of the application site, this integration seems to be beneficial for the patients and should be explored more in the future.

Article information

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