Use of the Abbott EnSite Precision three-dimensional mapping system for the placement of an atrial pacemaker lead in a patient with congenital heart disease

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ABSTRACT

We report the use of the Abbott three-dimensional mapping system (EnSite Precision) for the placement of an atrial pacemaker lead in a patient after modified Fontan procedure. The mapping system was used for the identification of a promising pacing site in the complexly modified right atrium and to visualize the successful placement of an atrial lead at the same spot.

Keywords: Congenital heart disease, pacing, three-dimensional mapping

INTRODUCTION

We report the use of the EnSite Precision three-dimensional (3D) mapping system for the placement of an atrial pacemaker lead in a patient with complex congenital heart disease (tricuspid atresia with malposition of the great arteries, pulmonary stenosis, and dextroversio cordis) after modified Fontan procedure.[1-3] As access to the atria is limited in patients after Fontan procedure, substantial scarring in the right atrium/intraatrial tunnel was suspected, and identification of a sufficient pacing site was uncertain. The mapping system was used for the identification of a promising pacing site and to visualize the successful placement of an atrial lead.

PROCEDURE

A 10-pole steerable electrophysiology catheter was introduced through a 6 F sheath in the left subclavian vein. A voltage map was done using the EnSite Precision 3D mapping system and two possible target zones could be identified [Figure 1a]. The voltage for normal atrial myocardium was defined ≥0.5 mV; the scar was defined as a voltage <0.2 mV, and the anatomy is outlined schematically. The catheter was then removed, and a bipolar, endocardial pacemaker lead (Biotronik Solia S53) was introduced through a peelable sheath. The lead was connected to the 3D mapping system through clamps to both proximal poles of the lead. Thereby, the tip of the lead could elegantly been displayed in the 3D map (white arrow) and the lead was placed without any complications in the targeted area. Figure 1b shows the corresponding lead position in X-ray. We found excellent parameters with a sensing of 1.2 mV and pacing threshold of 0.9 V at 0.4 ms. The pacemaker was connected and the procedure completed as usual. The radiation dose was 49.2 cGy/cm^2. Yet, radiation doses are barely comparable between the patients, as these procedures vary significantly from patient to patient, especially as reduction of fluoroscopy was only one aspect of the reported procedure. The patient did very well at 6-month follow-up, and the pacemaker lead showed good sensing and pacing thresholds.

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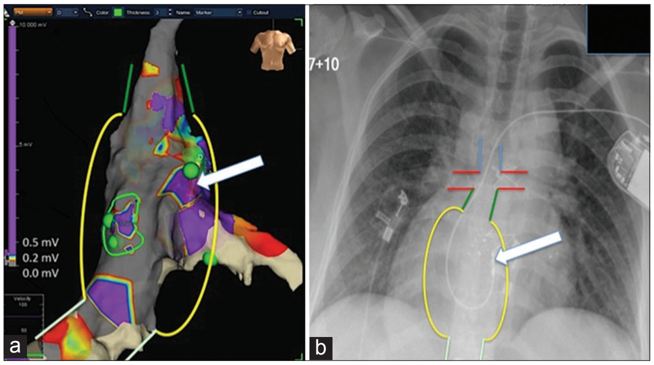

Figure 1: (a) Displays the voltage map of the right atrial tunnel in anterior-posterior view. The tip of the pacemaker lead (white arrow) is visualized directly at the targeted pacing site. The green points mark areas with normal myocardium, i.e., local myocardia voltage ≥0.5 mV. (b) Shows the corresponding anterior-posterior fluoroscopic view with the atrial pacemaker lead (white arrow). The anatomy is outlined schematicly. Blue = Superior caval vein to right pulmonary vein anastomosis; Red = Right and left pulmonary arteries; Green = Stent graft connection between the intraatrial tunnel (yellow) and the pulmonary arteries (red); Yellow = Intraatrial tunnel; Bright green = Inferior caval vein

CONCLUSION

The Abbott EnSite Precision 3D mapping system can be effectively used for a targeted placement of pacemaker leads in patients with complex congenital heart disease.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Guo P, Qiu J, Wang Y, Chen G, Proietti R, Fadhle AS, *et al.* Zero-fluoroscopy permanent pacemaker implantation using Ensite NavX system: Clinical viability or fanciful technique? Pacing Clin Electrophysiol 2018;41:122-7.
2. Barbero U, Budano C, Golzio PG, Castagno D, Gaita F. Combining electromagnetic navigation and 3-D mapping to reduce fluoroscopy time and achieve optimal CRT response. Pacing Clin Electrophysiol 2018;41:557-60.
3. Velasco A, Velasco VM, Rosas F, Cevik C, Morillo CA. Utility of the navX® electroanatomic mapping system for permanent pacemaker implantation in a pregnant patient with chagas disease. Indian Pacing Electrophysiol J 2013;13:34-7.