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(Article begins on next page)

1 Pulmonary vein isolation through trans-jugular approach in a patient with inferior vena cava interruption

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6CASE REPORT

7A 50-year-old man, with surgically corrected congenital heart disease (ostium secundum atrial septal defect associated 8 with partial anomalous pulmonary venous return and inferior vena cava – IVC - interruption), sick sinus syndrome (for 9which he was implanted with a single-lead atrial pacemaker) and two ablation procedures for right incisional atrial 10tachycardia, was referred to our institution to undergo pulmonary vein isolation (PVI) due to drug-refractory 11paroxysmal atrial fibrillation (AF). The rare congenital anomaly (IVC interruption with azygos continuation), precluded 12conventional inferior transfermoral venous approach, thus a superior transjugular approach was planned. The procedure 13was performed under conscious sedation. Transseptal puncture under transesophageal echocardiography i-guidance was 14performed via the right internal jugular vein with a PREFACE^R sheath (Biosense Webster) and a manually curved 15Brockenbrough needle with a 120° angle to manipulate the tip downward to the fossa ovalis. Electroanatomical (EA) 16mapping of the left atrium (CARTO, Biosense Webster) was performed using a multipolar catheter (PENTARAY^R, 17Biosense Webster). CARTO VIZIGOTM Bi-Directional Guiding Sheath was then introduced and radiofrequency 18delivered at the pulmonary vein ostia. Complete PVI was confirmed by disappearance of venous potentials on the 19multipolar mapping catheter, and validated through exit block. No periprocedural complications occurred and the 20patient was discharged from the hospital sinus rhythm. in 21Left atrial transseptal access is typically performed by inferior transfemoral venous approach. However, in a small 22subgroup of patients, such as those with congenital IVC interruption, a superior approach from the right internal jugular 23vein or left axillary/subclavian vein is required to gain access to the left atrium¹⁻³. Alternatively, thoracoscopic AF 24ablation may be considered. In the reported case of AF ablation through unconventional trans-jugular approach, we 25propose the use of a guiding sheath, visualised on the electroanatomic mapping system, to significantly facilitate 26ablation catheter manipulation. Radiofrequency application reaching the target site with unconventional loops, such as 27those shown in Figure 1 and in the videos (Supplementary Video 1 and 2), would have hardly been possible without real 28time, continuous monitoring of the spatial relationship between the steerable guiding sheath and the ablation catheter.

29Figure 1. 3D visualization of the steerable guiding sheath enabling the ablation catheter to reach target ablation 30site by unconventional loops. A) Fluoroscopic anterior views during left atrium mapping; B) Latero-lateral 3D EA 31view during ablation of the ridge between the left superior pulmonary vein and the left appendage; C) Postero-anterior 323D EA views during right pulmonary vein ablation; D) Antero-posterior 3D EA view during right pulmonary vein 33ablation.



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34

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