

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

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

**This is the author's manuscript**

*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/1861860> since 2022-11-12T09:21:14Z

*Published version:*

DOI:10.1007/s10840-021-01114-8

*Terms of use:*

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

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

2 Andrea Saglietto MD<sup>1</sup>, Gaetano Maria De Ferrari Prof<sup>1</sup>, Federico Ferraris MD<sup>1</sup>, Matteo Anselmino Prof<sup>1</sup>

3<sup>1</sup>Division of Cardiology, Department of Medical Sciences, University of Turin, “Città della Salute e della Scienza”, Turin, Italy

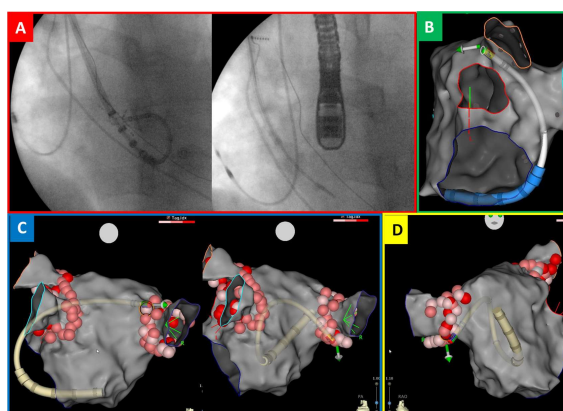
4**Conflict of interests:** Prof. Matteo Anselmino is consultant for Biosense Webster and has received educational grants from Abbott.

5**Corresponding author:** Andrea Saglietto; email: andrea.saglietto@live.com

## 6CASE REPORT

7A 50-year-old man, with surgically corrected congenital heart disease (ostium secundum atrial septal defect associated  
8with 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 transfemoral venous approach, thus a superior transjugular approach was planned. **The procedure**  
13**was performed under conscious sedation. Transseptal puncture under transesophageal echocardiography guidance was**  
14**performed via the right internal jugular vein with a PREFACE<sup>R</sup> sheath (Biosense Webster) and a manually curved**  
15**Brockenbrough 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<sup>R</sup>,**  
17**Biosense Webster).** CARTO VIZIGO™ 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  
19**multipolar** mapping catheter, and validated through exit block. No periprocedural complications occurred and the  
20patient was discharged from the hospital in sinus rhythm.  
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 atrium<sup>1-3</sup>. **Alternatively, thoracoscopic AF**  
24**ablation 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.

29**Figure 1. 3D visualization of the steerable guiding sheath enabling the ablation catheter to reach target ablation**  
30**site 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.



34

## 35References:

- 36 1. Santangeli P *et al.* How to perform left atrial transseptal access and catheter ablation of atrial fibrillation from a  
37 superior approach. *J Cardiovasc Electrophysiol* 2020;**31**:293–9.  
38 2. Lim HE *et al.* Catheter ablation of atrial fibrillation via superior approach in patients with interruption of the  
39 inferior vena cava. *Heart Rhythm* 2009;**6**:174–9.  
40 3. Kato H *et al.* Circumferential pulmonary vein ablation of atrial fibrillation via superior vena cava approach in a  
41 patient with interruption of the inferior vena cava. *Europace* 2010;**12**:746–8.

**1Acknowledgments:** We thank Dr. Chiara Pintor (Clinical Support Specialist, Biosense Webster - Johnson & Johnson Medical) for the  
**2**technical and editorial support.