

Cryoballoon Ablation of Atrial Fibrillation in a Patient with Dextrocardia with Situs Inversus

Situs Inversuslu ve Dekstrokardili Bir Hastada Atriyal Fibrilasyonun Kriyobalon ile Ablasyonu

A 54-year-old male patient with antiarrhythmic drug-refractory symptomatic paroxysmal atrial fibrillation was referred for atrial fibrillation ablation. Medical history revealed dextrocardia with situs inversus, without additional cardiac structural abnormalities. Previous multimodality imaging of the heart and other internal organs confirmed this congenital heart condition (Figure 1, Video 1). Typical electrocardiographic findings associated with dextrocardia were observed in the standard 12-lead surface electrocardiography (Figure 1). Following appropriate preprocedural and initial procedural preparations, all remaining procedural steps related to the ablation were performed using a mirror approach. An arterial vascular access (5F) for pressure monitoring and a venous vascular access (6F) for coronary sinus catheter advancement were established through the right femoral artery and vein, respectively. The transseptal puncture was performed via the left femoral vein (Video 2). In accordance with the mirror approach, the hub of the transseptal sheath and the tip of the transseptal needle were rotated to 7 or 8 o'clock, as opposed to 4 or 5 o'clock in normal anatomy (Figure 2). After gaining transseptal access, a common pulmonary vein on the left atrial appendage side and two pulmonary veins on the contralateral side were isolated using a 28 mm cryoballoon catheter (Video 3).

When orienting and placing the catheter, sheath, and needle using conventional fluoroscopy, the detector of the fluoroscopy system should be adjusted according to the cardiac rotation/deviation in the horizontal plane. In patients with dextrocardia and situs inversus or solitus, mirror-image projections assist the operator due to the counterclockwise rotation of the heart. Thus, opposite projections such as the right anterior oblique and left anterior oblique can be used interchangeably for more convenient orientation during the procedure.

Informed Consent: Informed consent was obtained from the patient for the publication of the case image and accompanying images.

Peer-review: Internally peer-reviewed.

Author Contributions: Concept – S.Ç.; Design – S.Ç.; Supervision – S.Ç.; Materials – S.Ç.; Data Collection and/or Processing – S.Ç.; Writing – S.Ç.; Critical Review – Ö.Ö., F.Ö., M.K., H.Ç., A.K., S.T.

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study received no financial support.

Video 1. Coronal body slices progressing from anterior to posterior and from posterior to anterior clearly demonstrate situs inversus totalis and dextrocardia.
H, Head.


Video 2. Transseptal puncture procedure performed via the left femoral vein.

Video 3. Procedural steps of advancing a multipolar catheter into the coronary sinus via the right femoral vein, followed by pulmonary vein isolation using cryoballoon ablation.

CBC, Cryoballoon Catheter; CMC, Circular Mapping Catheter; CS, Coronary Sinus; FO, Fossa Ovalis; LAO, Left Anterior Oblique; LFV, Left Femoral Vein; PV, Pulmonary Vein; RAO, Right Anterior Oblique; RFV, Right Femoral Vein; TS, Transseptal.

CASE IMAGE OLGU GÖRÜNTÜSÜ

Serkan Çay 

Özcan Özeke 

Fırat Özcan 

Meryem Kara 

Elif Hande Özcan Çetin 

Ahmet Korkmaz 

Serkan Topaloğlu 

Division of Arrhythmia and Electrophysiology,
Department of Cardiology, University
of Health Sciences, Yüksek İhtisas
Cardiovascular Building, Ankara City
Hospital, Ankara, Türkiye

Corresponding author:

Serkan Çay

✉ cayserkan@yahoo.com

Received: January 19, 2023

Accepted: February 20, 2023

Cite this article as: Çay S, Özeke Ö, Özcan F, et al. Cryoballoon ablation of atrial fibrillation in a patient with dextrocardia with situs inversus. *Türk Kardiyol Dern Ars.* 2024;52(4):300-301.

DOI:10.5543/tkda.2023.24224



Available online at archivestsc.com.
Content of this journal is licensed under a
Creative Commons Attribution –
NonCommercial–NoDerivatives 4.0
International License.

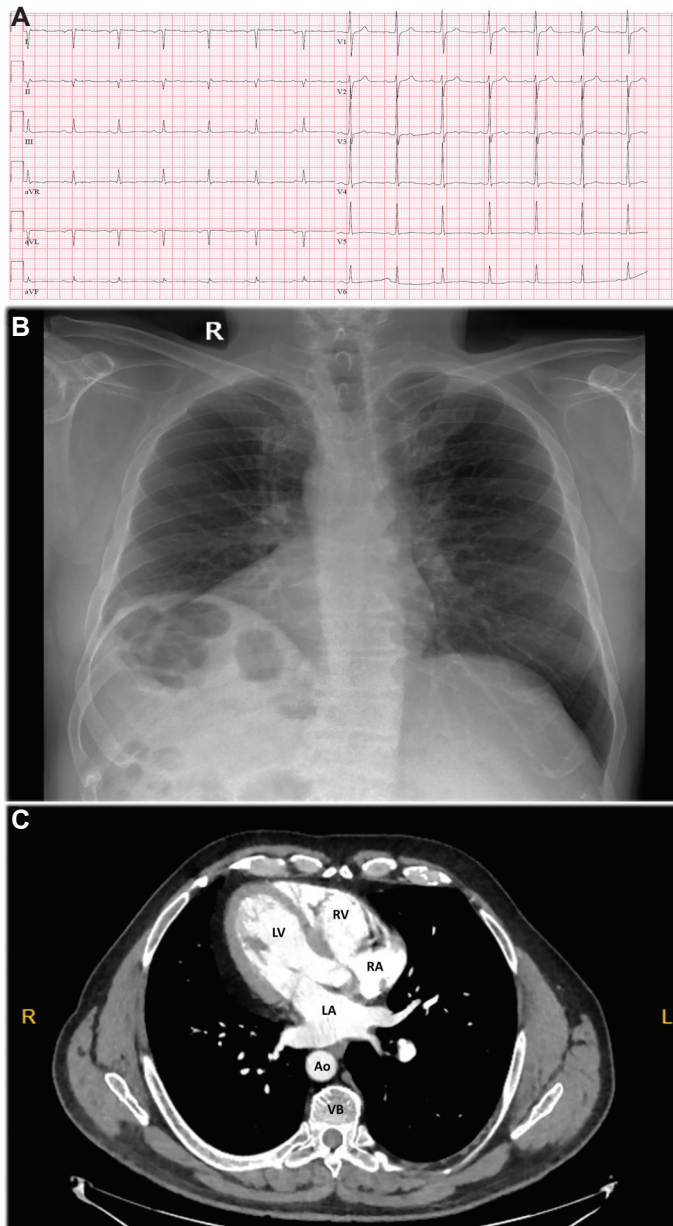


Figure 1. A 12-lead surface electrocardiography displaying all negatively deflected P/QRS waves in leads I and aVL, positively deflected P/QRS waves in lead aVR, right-axis deviation in the frontal plane, and absence of normal R-wave progression through leads V1 to V6 (A). A posteroanterior chest X-ray shows the cardiac silhouette and apex predominantly situated on the right hemidiaphragm with the aortic arch on the right side and an air-filled stomach below the right hemidiaphragm (B). Contrast-enhanced computed tomography illustrates the heart's counterclockwise rotation with the apex pointing to the right side. The descending aorta is located on the right side in front of the vertebral body. A common pulmonary vein on the right side and two pulmonary veins on the left side drain into the left atrium (C).
 Ao, Aorta; L, Left; LA, Left Atrium; LV, Left Ventricle; R, Right; RA, Right Atrium; RV, Right Ventricle; VB, Vertebral Body.

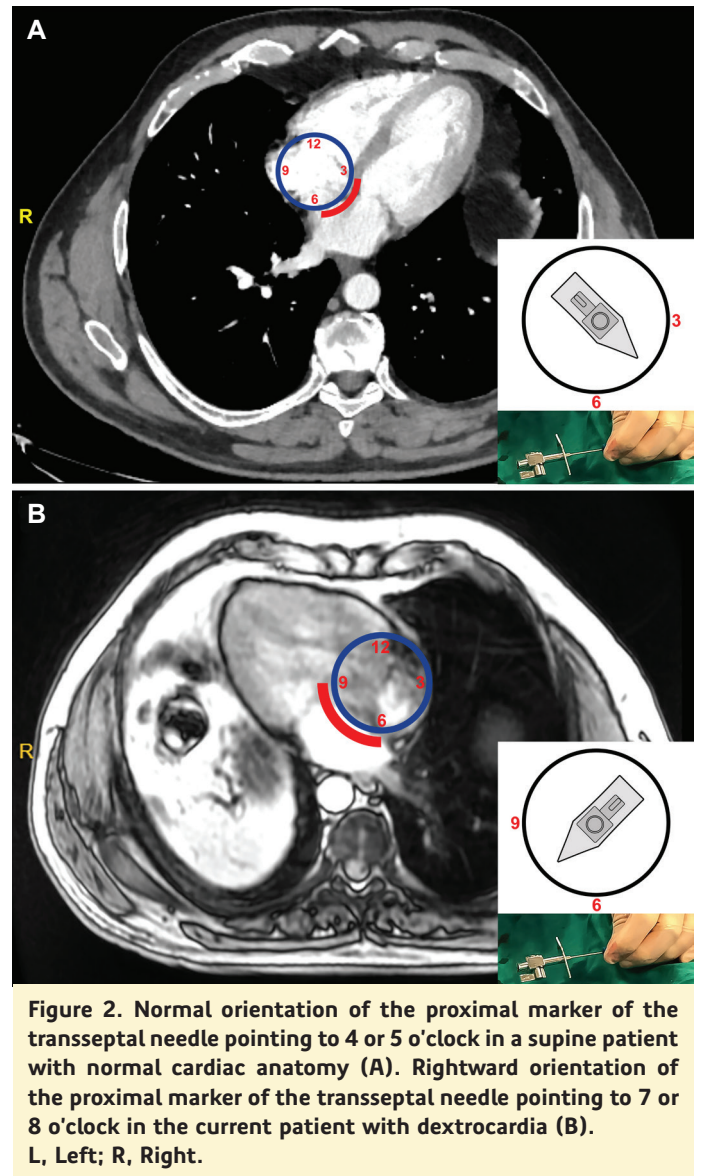


Figure 2. Normal orientation of the proximal marker of the transseptal needle pointing to 4 or 5 o'clock in a supine patient with normal cardiac anatomy (A). Rightward orientation of the proximal marker of the transseptal needle pointing to 7 or 8 o'clock in the current patient with dextrocardia (B).
 L, Left; R, Right.