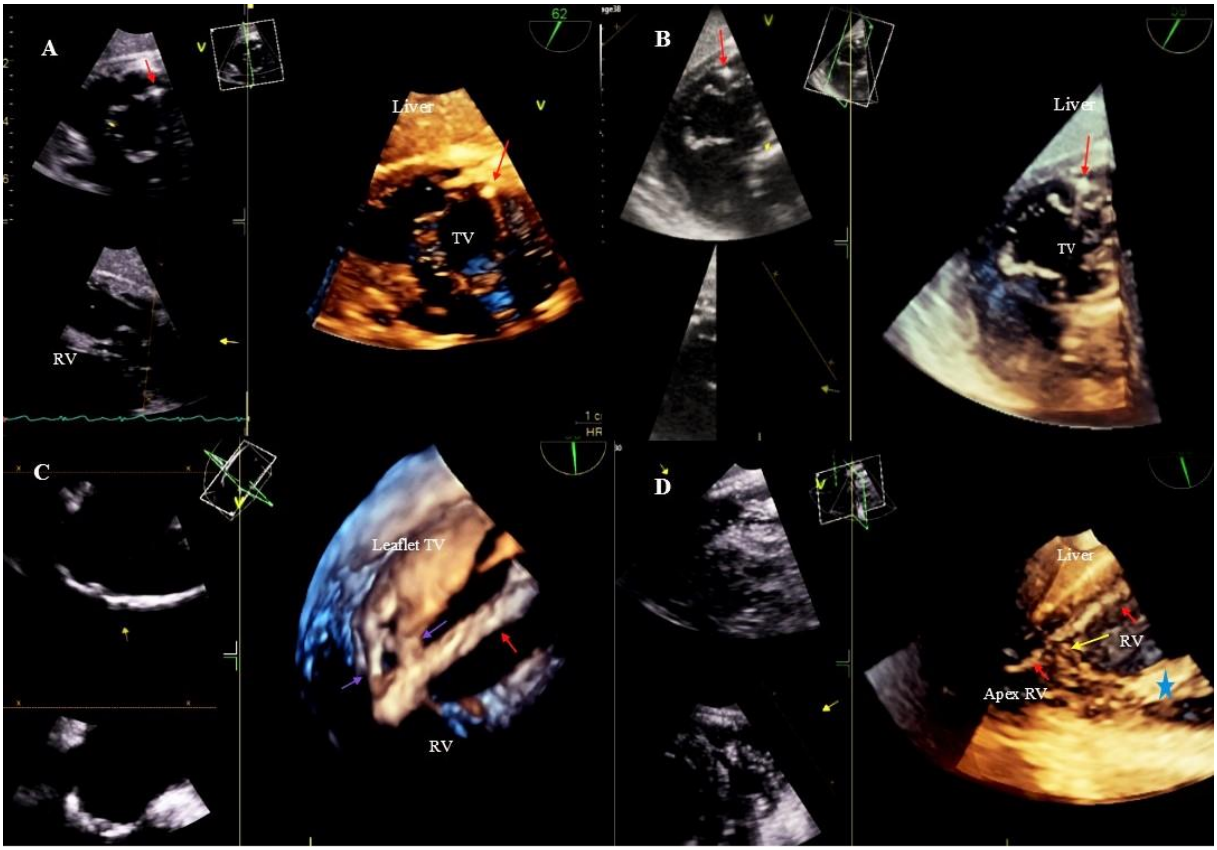
Supplementary material

Nowosielecka D, Polewczyk A, Jacheć W, et al. Transesophageal echocardiography for the monitoring of transvenous lead extraction. Kardiol Pol. 2020; 78: 1206-1214. doi:10.33963/KP.15651.



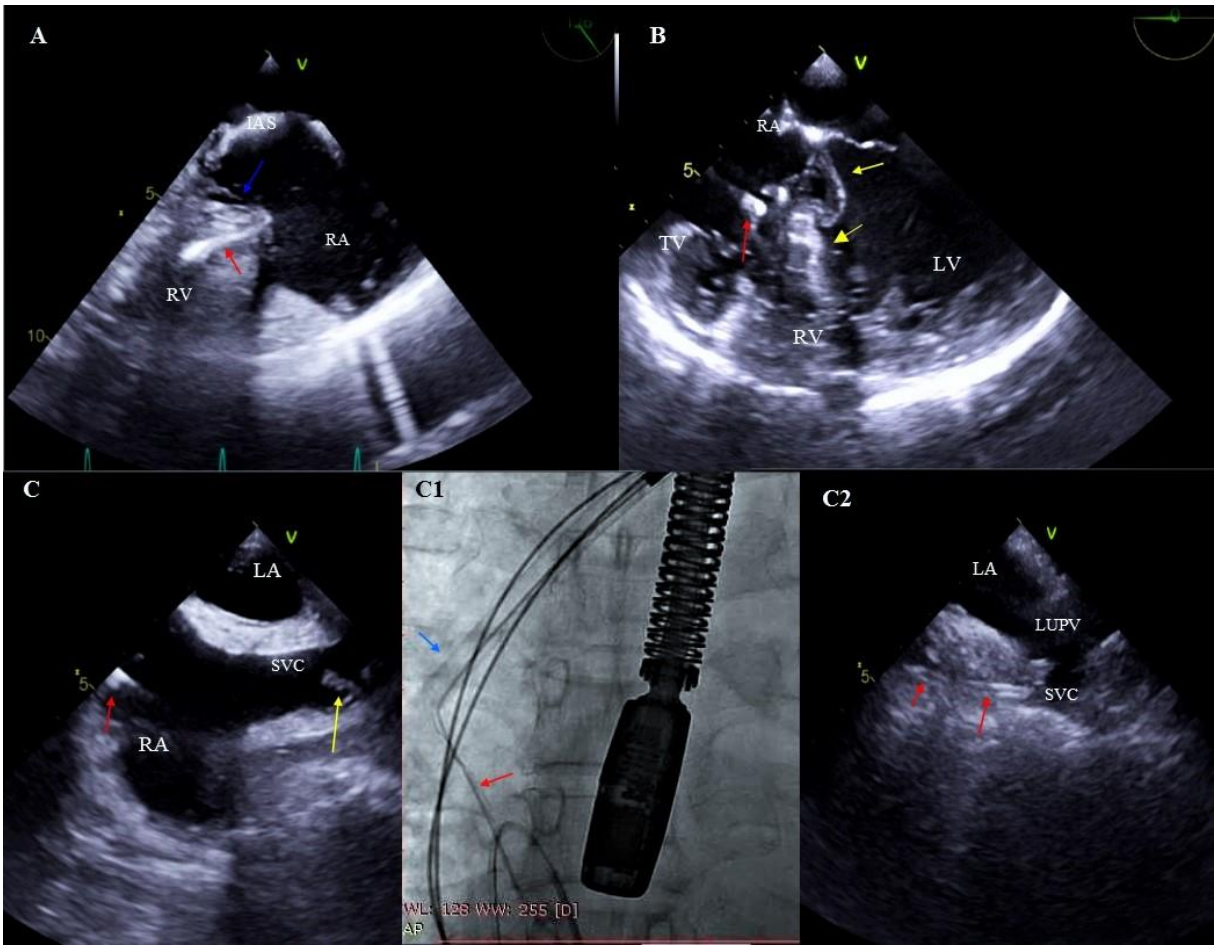
Supplementary Figure S1 Use of 3D transesophageal echocardiography to visualize the position of the lead in relation to the tricuspid valve

A. Ventricular lead (red arrow) passing near the annulus of tricuspid valve in the commissure between the septal and posterior leaflet. Transesophageal echocardiography (3D, transgastric view). Viewed from the right atrium side.

B. Ventricular lead (red arrow) perforating the posterior leaflet of tricuspid valve. Viewed from the right atrium side.

C. Lead adhesion (red arrow) to the leaflet edge (violet arrows). Transesophageal echocardiography (3D, transgastric view). Viewed from the right atrium side.

D. Assessment of lead position (red arrows) in relation to the base of the papillary muscle (blue asterisk), lead adhesion to the ventricular endocardium (yellow arrow). Transesophageal echocardiography (3D, transgastric view)



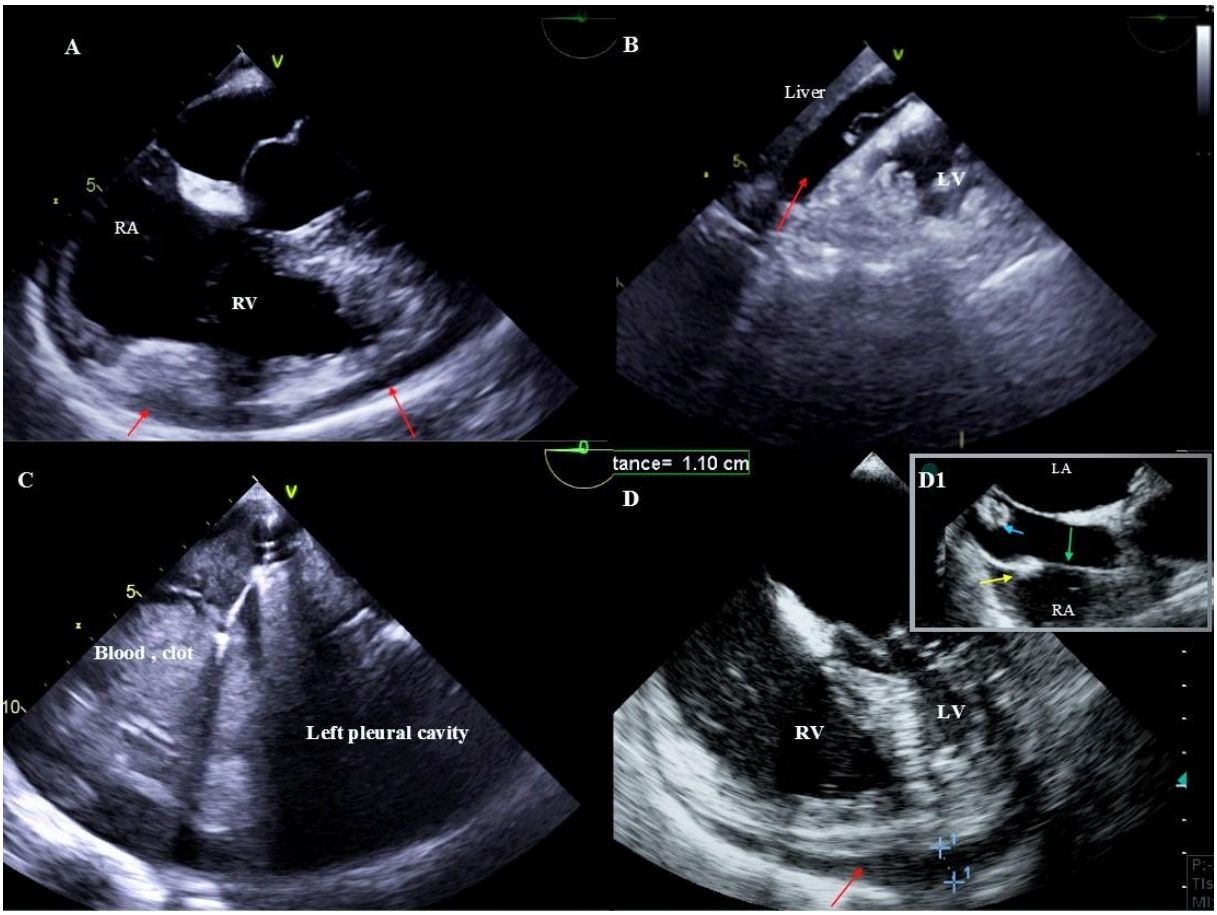
Supplementary Figure S2 Right ventricular cavity obliteration or superior vena cava occlusion as a cause of hemodynamic instability during transvenous lead extraction

A. Extraction of the ventricular lead with surrounding ingrown scar tissue (red arrow) with strong pulling on ventricular walls and displacement to the level of the tricuspid

valve producing transient ventricular obliteration, traction on the valvular leaflet (blue arrow). Transesophageal echocardiography (2D, mid-esophageal - modified view)

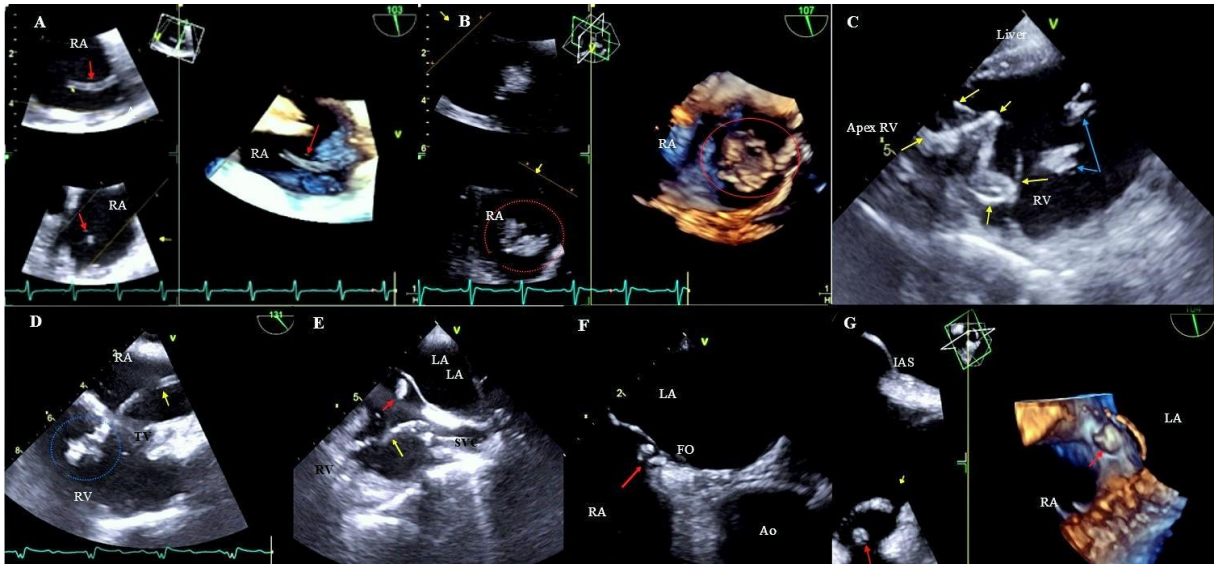
B. Pulling on the ventricular lead (red arrow) with simultaneous traction on the RV wall and cavity obliteration, displacement of the interventricular septum (yellow arrows). Transesophageal echocardiography (2D, mid-esophageal, four chamber views)

C. Normal image of the superior vena cava after lead extraction, fibrous accretion in the lumen (yellow arrow). (C2) Occlusion of the superior vena cava lumen during removal of another lead adhering to the venous wall (red arrows). Transesophageal echocardiography (2D, bicaval view). (C1) Simultaneous fluoroscopy, the dissection catheter (blue arrow)



Supplementary Figure S3 Transesophageal imaging of significant pericardial and pleural bleeding requiring urgent cardiac surgical intervention

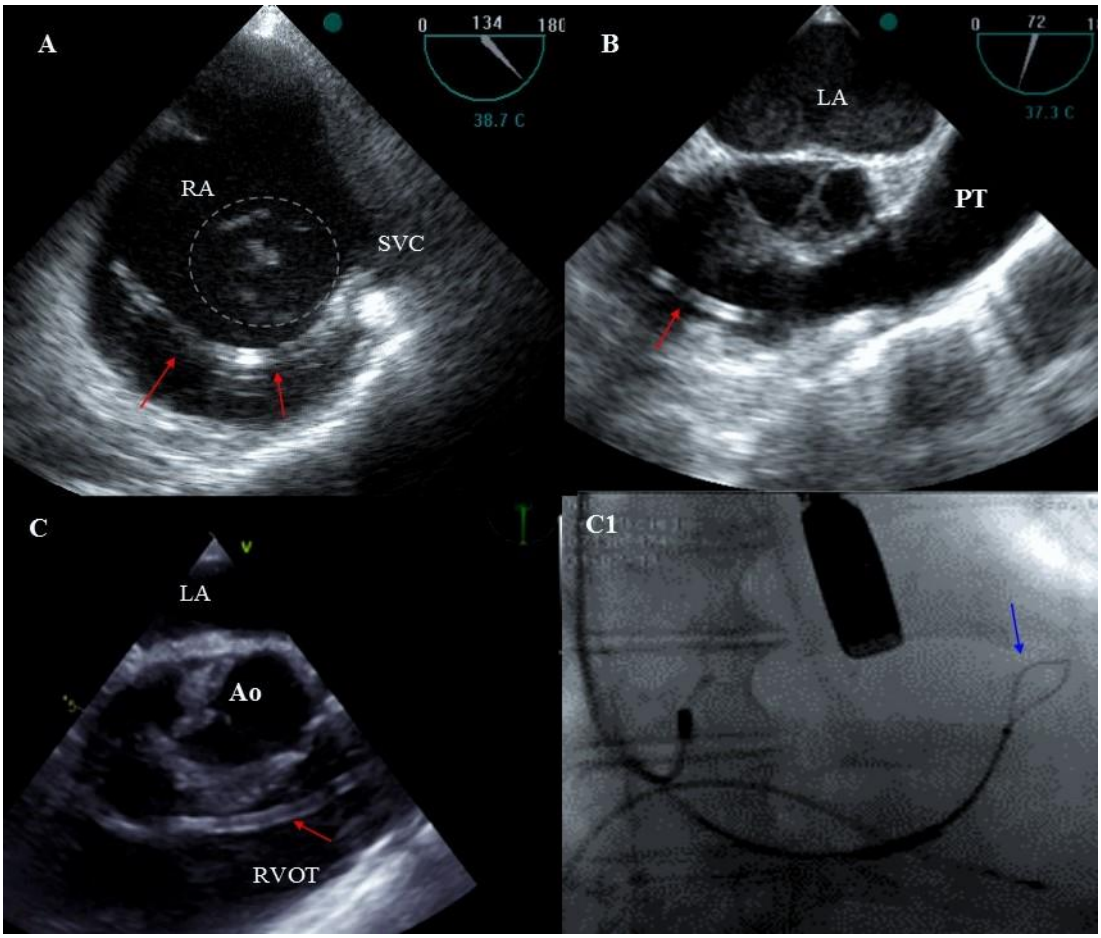
A. Pericardial layer separation (red arrows). Transesophageal echocardiography (2D, mid-esophageal four chamber modified view)
B. Pericardial sac filled with blood. Transesophageal echocardiography (2D, transgastric view)
C. Hemorrhage to the left pleural space. Transesophageal echocardiography (2D)
D. Pericardial layer separation due to right atrium wall injury. (D1) Injury site in the right atrium wall (yellow arrow). Mobile hyperechoic fibrous tissue – accretion (blue arrow) in the vicinity of the inferior vena cava. Pulling on the right atrium wall (yellow arrow) during extraction of the ventricular lead with ingrown scar tissue (green arrow). Transesophageal echocardiography (2D, four chamber view).



Supplementary Figure S4 Structures in cardiac cavities detected by transesophageal echocardiography after transvenous lead extraction

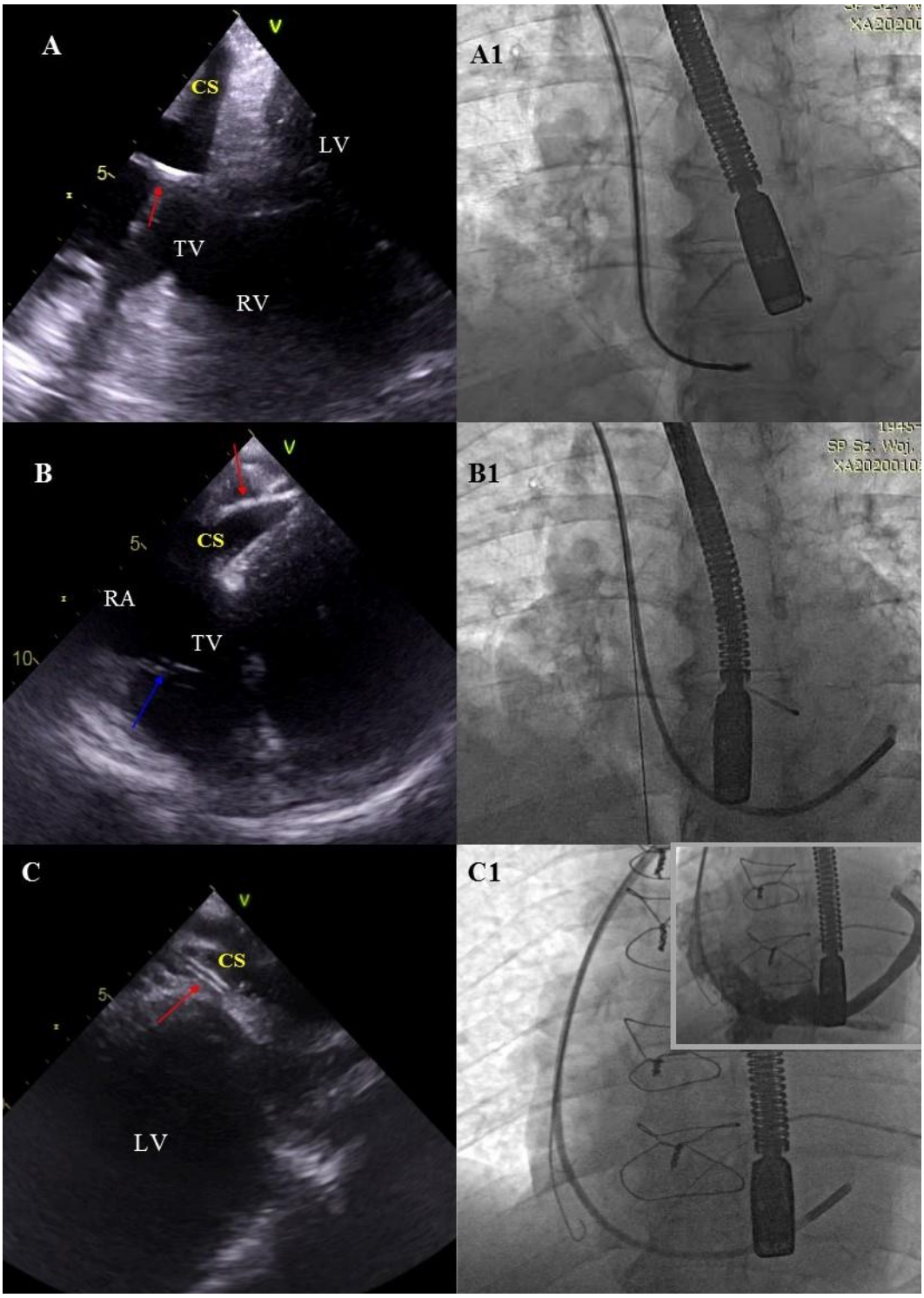
A. Fibrous encapsulation (red arrow) remaining in the atrial cavity after lead removal. Transesophageal echocardiography (3D, bicaval view)
B. 3.5x1.7 cm piece of vegetation remaining in the right atrium after lead removal. Transesophageal echocardiography (3D, bicaval view).
C. Lead fragment ingrown with endocardial tissue (and the conductor loop) (arrows) remaining in the right ventricle apical region. Components of the subvalvular apparatus: papillary muscle and tendinous chords (blue arrows). Transesophageal echocardiography (3D, transgastric view).
D. Fragment of the thickened hyperechoic lead adherent to the subvalvular apparatus (blue circle) and fragment of the silicone tube (yellow arrow). Transesophageal echocardiography (2D, mid- esophageal view)

E, F,G Images of the calcified fibrous tissue freed during atrial lead extraction (red arrow), dislodging into the foramen ovale. Transesophageal echocardiography (2D, 3D).



Supplementary Figure S5 Transesophageal echocardiographic images of insulation fragments remaining after transvenous lead extraction in right cardiac cavities

A. Linear structure representing the silicon insulation (red arrows) with additional mobile remnants of the fibrous scar tissue in the RA cavity after lead extraction (grey circle). Transesophageal echocardiography (2D, bicaval modified view).
B. Fragment of the silicon tube in the right ventricular outflow tract. Transesophageal echocardiography.
C. Fragment of the silicon tube (red arrow) dislodged to the pulmonary trunk. (2D, mid-esophageal view) (C1) Attempt at grasping the silicon tube (invisible on fluoroscopy) with a lasso catheter (blue arrow) under transesophageal echocardiography guidance.



Supplementary Figure S6 Monitoring the process of coronary sinus intubation before placement of left ventricular pacing lead. Simultaneous transesophageal echocardiography (A–C) and fluoroscopy (A1–C1)

A. Shadow of the catheter (red arrow) below the coronary sinus ostium

B. Normal position the catheter in the coronary sinus, posterior tricuspid valve leaflet (blue arrow). Transesophageal echocardiography (2D, mid-esophageal view)

C. Catheter (red arrow) in the coronary sinus lumen immediately before contrast injection

A1–C1 Corresponding fluoroscopy images.