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Transvenous recovery of a foreign body inside the lumen of the segmental branches of the right pulmonary artery tree



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The optimal management of implanted devices has become a worldwide serious challenge and many techniques for device complications have been developed including endovascular retrieval of lost or misplaced fractured foreign objects [1–6]. The use of implantable cardiac devices has increased in the last 30 years [7–56]. Infectious complications leading also to endocarditis [21–30] and noninfectious complications [30,31] often necessitating removal [31–34] have affected patients' wellbeing and led to an increase in psychological difficulties [35] in the emerging scenario of concomitant problems and diseases [36–71] and in patients also needing of device revision and upgrade. In addition, the improved patients' survival, the progressively younger implanted population and the increase in device and procedure complexity have raised the risk of system component structural failures [41–71]. For these reasons, the necessity of extraction has become increasingly higher and the development of specific techniques and tools to reduce morbidity and mortality associated with pacing devices' removal has played an important role representing the cornerstone of the modern clinical cardiac electrophysiology as well as efficacious cardiac devices implantation and management. Mechanical technique (transvenous lead extraction) is an effective technique with few complications, but a collaborative vision of a multi-disciplinary treatment team is required for patient's safety and complete rehabilitation [4,37,41,42]. The safety and effectiveness of transvenous lead extraction has been

also demonstrated for difficult removal of dialysis catheters [6] and port catheters [2,4]. Percutaneous recovery of fragment of foreign bodies dislodged into the right atrium embolized into the lobar artery of the left lower lung lobe has been rarely reported in literature [72]. We present the recovery of a foreign body inside the lumen of the segmental branches of the tree of the right pulmonary artery. We received a patient with a distal portion fracture of a lead guide that occurred in another center during a malfunctioning pacemaker upgrade. Computed tomography images showed the presence of a thread-like radiopaque foreign body of several cm length inside the lumen of the segmental branches of the tree of the pulmonary artery of the middle and lower lobes in the right lung (Fig. 1). We successfully performed the transvenous fragment recovery using: a J Guide of 130 cm and a catheter loop of 115 cm, f 4 and 15 mm (with a loop opening diameter of 15 mm) flexed at 90 degrees by the right femoral vein access (Fig. 2 panels A, B and C). In Fig. 2 panel C the removed foreign body is shown. Also this case focuses on the safety and effectiveness of transvenous lead extraction and it is illustrative of its use as a new challenge in cardiology.

Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

Author contributions

Salvatore Patanè wrote the work; Giuseppe Mario Calvagna prepared the references [1 to 20] and performed the fragment recovery; Maria Cristina Inserra prepared the references [21 to 40], Antonio Celona prepared the references [41 to 73]; Ludovico Vasquez prepared Fig. 2 panel D and Fig. 2 panel D legend; Placido Romeo prepared panels A, B and C of Figs. 1 and 2, and the legends of Fig. 1 and Fig. 2 panels A, B and C.

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The authors of this manuscript have certified that they adhere to the statement of ethical publishing as appears in International Journal of Cardiology [73].

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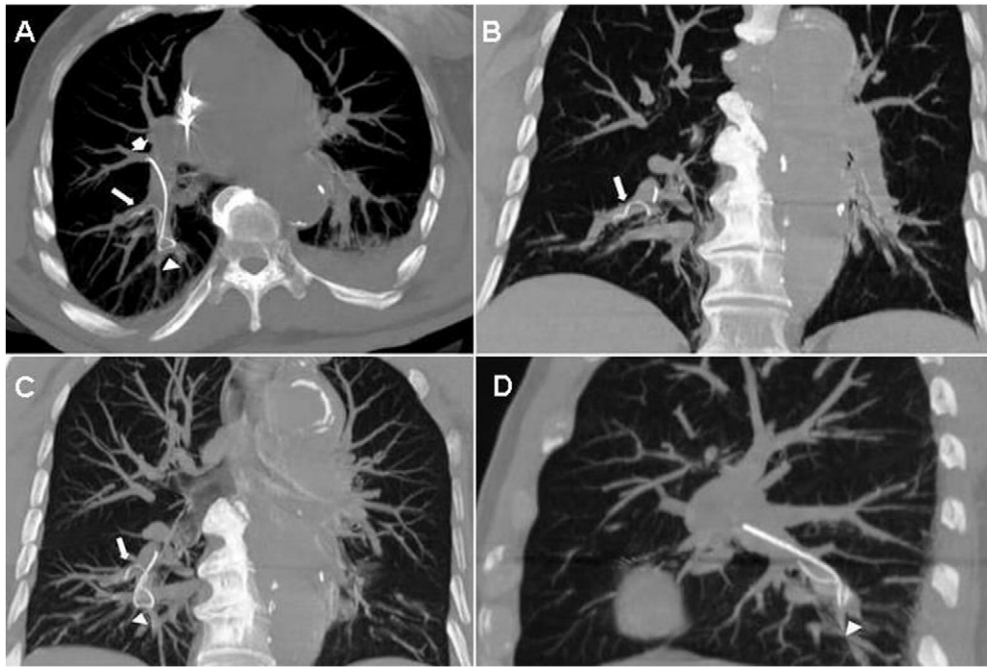


Fig. 1. (Panel A) Image TC oriented along an axial oblique plane and reconstructed with MIP algorithm – short white arrow: the proximal end of the foreign body protrudes into the lumen of the arterial branch to the lateral segment of the middle lobe (A4); thin arrow: the distal end of the same is positioned in the lumen of the arterial branch to the lateral-basal segment of the lower lobe (A9); arrowhead: the foreign body describes a loop in the lumen of the arterial branch to the posterior basal segment (A10). (Panel B): Picture TC oriented at an oblique coronal plane and reconstructed with MIP algorithm. The distal end of the foreign body is positioned in the lumen of the arterial branch to the lateral-basal segment (A9) of the lower lobe of the right lung. (Panel C): Image baseline TC oriented in a coronal oblique and reconstructed with MIP algorithm – arrow: distal end of the foreign body placed in the lumen of the arterial branch to the lateral-basal segment (A9) of the lower lobe; arrowhead: loop in the lumen of the arterial branch to the posterior basal segment (A10) of the lower lobe of the right lung. (Panel D) of the lower lobe of the lung – picture baseline TC oriented at an oblique sagittal plane and reconstructed with MIP algorithm – arrowhead: a radiopaque foreign body describes a loop in the lumen of the arterial branch to the posterior basal segment (A10) of right.

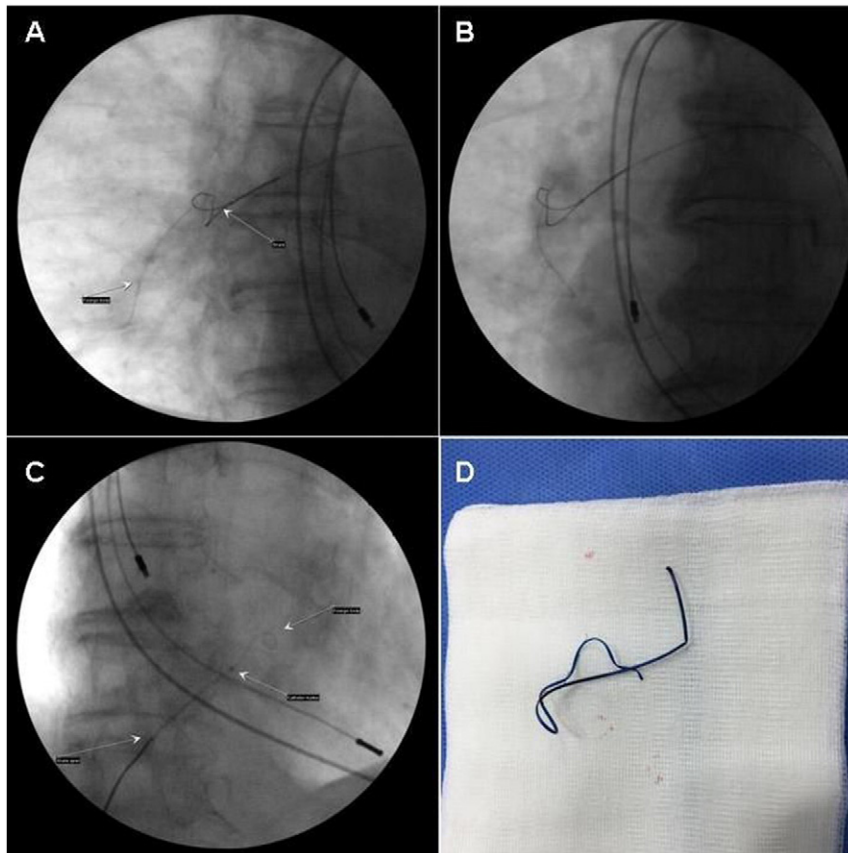


Fig. 2. (Panel A) The snare is catching the foreign body. (Panel B) The snare has caught the foreign body. (Panel C) The retrieval of the foreign body. (Panel D) The removed foreign body.

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