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Letter to the Editor

Transvenous pacemaker lead extraction by femoral approach

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The management of patients with implantable cardiac devices has become an increasing integral part of the cardiology in the last 30 years [1–6]. Research has leading progressively to the development of devices for the treatment of bradycardia, ventricular arrhythmia, and heart failure and for the prevention of sudden cardiac arrest with the delivery of pacemakers, implantable cardioverter defibrillators (ICD)s and cardiac resynchronization therapy (CRT) plus ICD (CRT-D) [1–22] and to the recent subcutaneous implantable cardioverter-defibrillator (S-ICD) [23–27]. Infectious complications leading also to endocarditis [1,6,8,28–36] and non-infectious complications [9,21,23,37–40] often necessitating removal [1,2,8,40–46] affect patients' wellbeing also leading to psychological difficulties increase [47–53] in the emerging scenario of concomitant problems and diseases [54–79] and in patients also needing of device revision and upgrade. Moreover, the electric shock delivered in difficult patients, cannot be sufficiently effective to suppress life-threatening ventricular arrhythmias and thus, in addition to the ICD, devices may be used that facilitate cardioversion such as epicardial cardioverter defibrillation patches or a subcutaneous single-*finger* cardioverter-defibrillator (ICD) *system* [80]. Epicardial patches are placed at the sides of the heart through Cardiac Surgery approach under general anesthesia, while subcutaneous single-*finger* cardioverter-defibrillator (ICD) *system* is placed through subcutaneous tunneling technique in general or local anesthesia by interventional cardiologist but also in this case, complications are demonstrated necessitating removal and subcutaneous. Finger system removal has been performed successfully too [80]. 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 [81]. 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. Nowadays cardiac rehabilitation in pacing patients' complications is an increasing scenario and it represents a serious challenge as well as its optimal management. Perioperative lead extraction management varies between extraction centers, and no clinical guidelines [82] have focused on the need for anticoagulation nevertheless routine peri- and post-operative anticoagulations have been advocated as a means to prevent vein occlusions including pulmonary embolism [83,84]. The use of new oral anticoagulants in this scenario has also been proposed although its use requires always thorough evaluation regarding risks and benefits based on an in depth understanding of each patient's comorbidities as well as its perioperative use requires further study [79]. Mechanical technique (transvenous lead extraction) is an effective and with few complications technique, but a collaborative vision of a multi-disciplinary treatment team [53,72] is required for patient's safety and complete rehabilitation [85–87]. Superior approach and femoral approach have been used. The femoral approach may improve overall success rates without relevantly increasing operative risk [87–90] in cases of failed or impossible subclavian approach. In our institute we performed transvenous lead extraction by femoral approach in 8% of cases. We present the transvenous femoral pacemaker lead extraction without complications (Fig. 1) in a man with a seven year old DDR pacemaker implanted by left subclavian vein entry-site approach with passive fixation. Also this case focuses on the safety and effectiveness of transvenous lead extraction.

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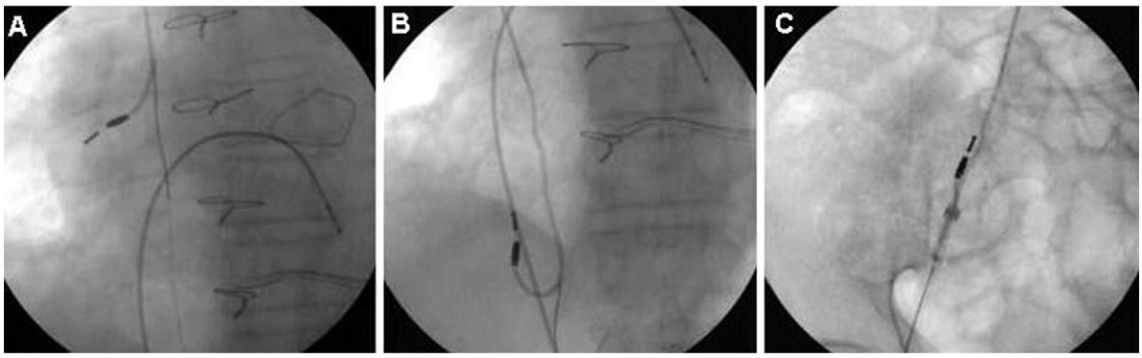

Fig. 1. Panels A, B and C: Transvenous femoral pacemaker lead extraction.

Author contributions

Salvatore Patanè wrote the work, and Giuseppe Mario Calvagna prepared the references, the figures and the figure legend.

Conflict of interest

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

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

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