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The safety and effectiveness of closure access leading venous advanced gain new ability



Giuseppe Mario Calvagna^{a,*}, Ludovico Vasquez^b, Francesco Patanè^c, Fabrizio Sansone^c, Fabrizio Ceresa^c, Laura Tassone^c, Salvatore Patanè^a

^a Cardiologia Ospedale San Vincenzo, Taormina (Me) Azienda Sanitaria Provinciale di Messina, 98039, Taormina, (Messina), Italy

^b Cardiologia Ospedale San Vincenzo, Taormina (Me) and Cardiologia Presidio Ospedaliero "G. Fogliani", Milazzo (ME) Azienda Sanitaria Provinciale di Messina, Italy

^c Cardiocirurgia Ospedale Papardo Messina, Azienda Ospedaliera Ospedali Riuniti Papardo Piemonte, 98158 Messina, Italy

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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 [1–36]. 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 [54–82] 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 [83–91]. 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. Mechanical multiple venous entry-site approach extraction technique has been used and it has been previously described by other authors [92] for removal of pacing and ICD leads and it was usually successful and safe when performed by well-trained operators with few serious complications [43] Superior approach and femoral approach have been used. The femoral approach may improve overall success rates without relevantly increasing operative risk [88] in cases of failed or impossible subclavian approach. A promising technique has been developed in our Center by Calvagna [93] with the dilator who remains in situ to facilitate the reimplantation of the new pacing lead. A J- or a Terumo guide is therefore inserted through the lumen of the Byrd dilator to overcome possible occlusion sites and the Byrd dilator is subsequently removed. Then, through the previously leaved guide in situ, venous introducers of increasing diameter (the size ranging from 7 to 16 F) are inserted to dilate the previous vein occlusion and overcome venous obstacles. Subsequently, the guide is removed and the new lead is inserted through the lumen of the largest venous introducer. At the end, the venous introducer is removed. In our experience, this simple technique effectively complements the mechanical multiple venous entry-site approach extraction, as it allows to safely and easily deliver the new lead overcoming possible venous occlusions. Additionally, our technique requires no expensive specialized material. Investigation on an adequately large sample is needed to verify the safety and efficacy of this technique. We present a transvenous femoral pacemaker lead extraction without complications in a 68 year old woman in presence of life-threatening malfunction of four year old PM ICD and low battery voltage. A history of arrhythmias [94–98] and dilated cardiomyopathy (CMD) on 2011 required PM ICD implantation with left subclavian vein entry-site approach in this patient. A left subclavian vein entry-site approach was initially attempted with Byrd dilators (Fig. 1 Panels A and B) after a ventricular lead detachment, a ventricular lead rupture with the upper subclavian vein lead ventricular presence was observed (Fig. 1 Panels C and D) and a recovery by femoral approach was performed with the help of a loop catheter (Fig. 2 Panel A). Then, a j guide was inserted through left

* Corresponding author at. Cardiologia Ospedale San Vincenzo, Taormina (Me), Azienda Sanitaria Provinciale di Messina, Contrada Sirina, 98039, Taormina, (Messina).

E-mail address: gicalvagna@tiscali.it (G.M. Calvagna).

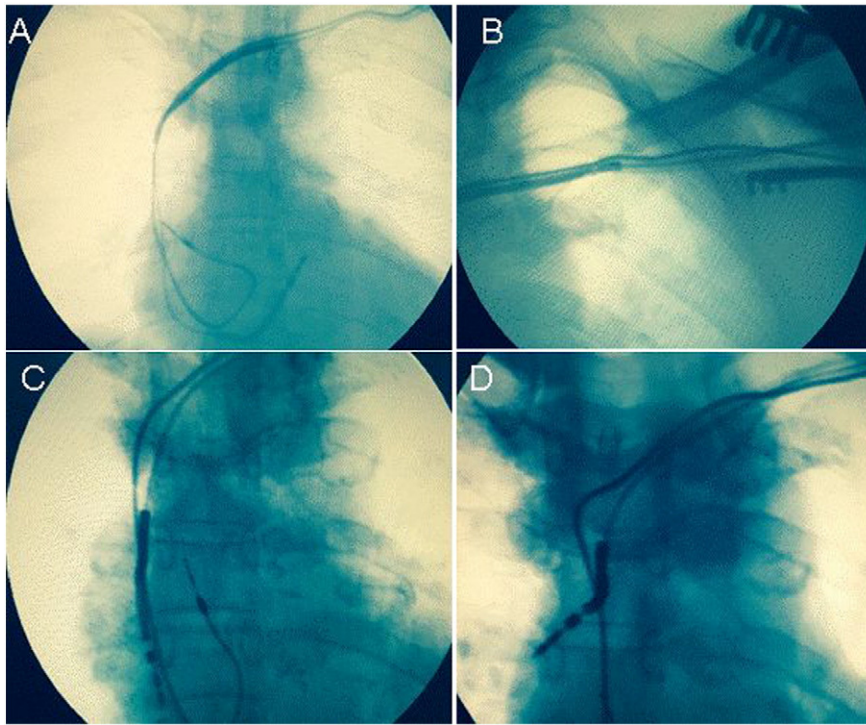


Fig. 1. Panels A and B: a left subclavian vein entry-site approach was initially attempted with Byrd dilators. Panels C and D: after a ventricular lead detachment, a ventricular lead rupture with the upper subclavian vein lead ventricular presence was observed.

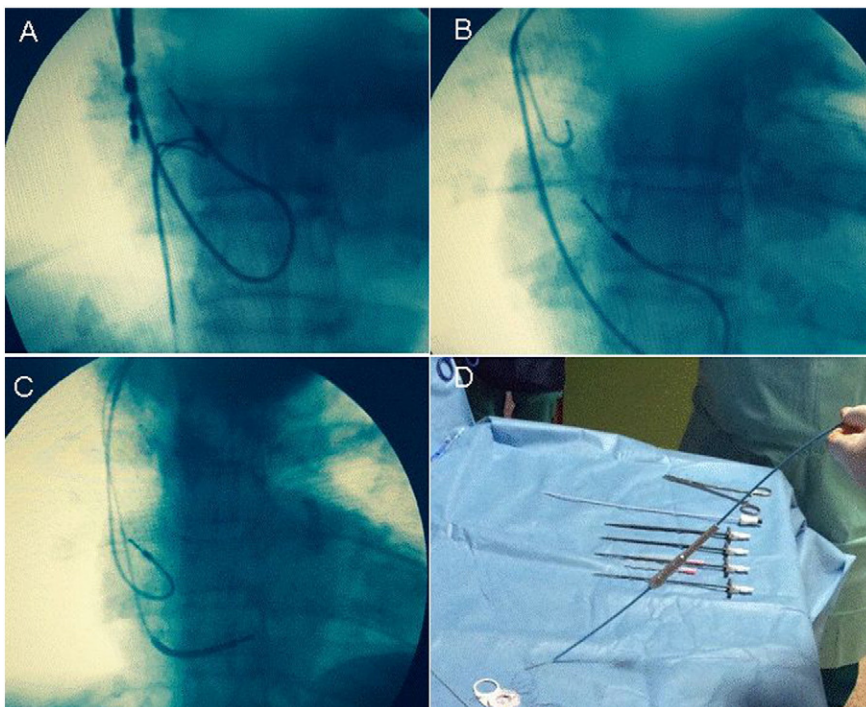


Fig. 2. Panel A: a recovery by femoral approach was performed with the help of a loop catheter. Panel B: a j guide was inserted through left subclavian vein Byrd dilators left in situ with Calvagna Technique. Panel C: the new leads were placed in situ. Panel D: materials: Byrd dilators and venous introducers of increasing diameter.

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