Table S1. Equipment used during transvenous lead extraction

Locking stylet or lumenless lead extender (Liberator® Beacon® Tip Locking Stylet or Bulldog™ Lead Extender, Cook Medical, Bloomington, IN, USA)
Dilators (Byrd Dilator Sheaths Telescoping Polypropylene, Cook Medical, Bloomington, IN, USA).
Powered mechanical sheath (Evolution Mechanical Dilator Sheath and, since 2018, Evolution® RL Controlled-Rotation Dilator Sheath Set, Cook Medical, Bloomington, IN, USA)
Side loop (Needle's Eye Snare®, Cook Medical, Bloomington, IN, USA)

Table S2. Laboratory parameters with univariate comparison between broken lead and non-broken lead during TLE patients.

Variable	The entire group, n =702 patients	The broken lead during the TLE group, n = 56 patients	The non-broken lead during the TLE group, n = 646 patients	p-value
White blood cell count (x10^3/ul)	7.7±2.7	7.5±2.6	7.7±2.7	0.4518
Haemoglobin (g/dl)	13.5 ± 2.1	13.7±1.8	13.5±2.1	0.8507
Platelet (x10^3/ul)	213.1±79.8	215.5±60.0	212.9±81.4	0.2848
Creatinine level (mg/dl)	1.1±0.6	1.0±0.4	1.1±0.6	0.0253
C-reactive protein level (mg/l) n= 600	13.7±31.2	14.0±34.7	13.7±30.9	0.7064
D-dimer level (ng/ml) n= 451	1250.0± 2467.2	774.9± 1141.9	1296.2± 2555.9	0.0306
Fibrinogen (g/l) n= 439	3.9±1.1	4.0±1.0	3.9±1.1	0.6921
TLE - transvenous lead extraction				

Table S3. Characteristics of systems being extracted with univariate comparison between broken lead and non-broken lead during TLE patients.

Variable	The entire group, n =702 patients	The broken lead during the TLE group, n = 56 patients	The non-broken lead during the TLE group, n = 646 patients	p-value
Date of first implantation (year)	2011.1±7.3	2002.1±8.4	2011.9±6.6	< 0.0001
Longest dwell time (years)	9.2±7.1	18.0±8.3	8.4±6.5	< 0.0001
Time since last procedure (years)	4.5±3.3	5.2±3.6	4.5±3.3	0.1462
Total number of previous interventions in the system (e.g. generator replacements or upgrades), n%	0.7±0.9	1.6±1.0	0.7±0.9	< 0.0001
At least one lead dysfunction (lead fracture or insulation failure resulting in abnormalities of impedance, sensing or capture), n (%)	415 (59.1%)	41 (73.2%)	374 (57.9%)	0.0254
Pacemaker, n (%)	407 (58.0%)	40 (71.4%)	367 (56.8%)	0.0336
Implantable cardioverter-	166 (23.6%)	6 (10.7%)	160 (24.8%)	0.0177

defibrillator device, n (%)				
Cardiac resynchronize therapy (P/D) device, n (%)	127 (18.1%)	10 (17.9%)	117 (18.1%)	0.9622
Atrial lead, n (%)	541 (77.1%)	50 (89.3%)	491 (76.0%)	0.0235
Right ventricular sense-pace lead, n (%)	423 (60.3%)	38 (67.9%)	385 (59.6%)	0.2260
Right ventricular VDD lead, n (%)	14 (2.0%)	7 (12.5%)	7 (1.1%)	< 0.0001
Right ventricular CSP lead, n (%)	16 (2.3%)	2 (3.6%)	14 (2.2%)	0.4997
Right ventricular high voltage lead, n (%)	274 (39.0%)	14 (25.0%)	260 (40.2%)	0.0249
Coronary sinus lead, n (%)	118 (16.8%)	10 (17.9%)	108 (16.7%)	0.8271
Total amount of leads before TLE	2.1±0.7	2.4±0.8	2.0±0.7	0.0002
Total amount of abandoned leads before TLE	0.1±0.4	0.4±0.6	0.1±0.3	< 0.0001
CIED – cardiac implantable electronic device, TLE - transvenous lead extraction, D/P – defibrillator or pacemaker, CSP – Conduction system pacing				

Table S4. Techniques and conduct of the TLE procedure with univariate comparison between broken and non-broken leads during TLE patients.

Variable	The entire group, n =702 patients	The broken lead during the TLE group, n = 56 patients	The non-broken lead during the TLE group, n = 646 patients	p-value
Total amount of leads being extracted	2.0±0.7	2.4±0.8	1.9±0.7	0.0001
Simple traction only, n (%)	168 (23.9%)	0 (0.0%)	168 (26.0%)	< 0.0001
Locking stylet, n (%)	515 (73.4%)	55 (98.2%)	460 (71.2%)	< 0.0001
Both single traction and mechanical sheath systems (dilators and/or powered mechanical sheaths), n (%)	530 (75.5%)	54 (96.4%)	476 (73.7%)	0.0001
Mechanical non-powered telescopic sheaths, n (%)	383 (54.6%)	38 (67.9%)	345 (53.4%)	0.0373
Powered rotational mechanical sheats, n (%)	214 (30.5%)	25 (44.6%)	189 (29.3%)	0.0165
Both mechanical sheath systems (non-powered and powered), n (%)	67 (9.5%)	9 (16.1%)	58 (9.0%)	0.0833
Side loop, n (%)	54 (7.7%)	20 (35.7%)	34 (5.3%)	< 0.0001
Simple loop, n (%)	33 (4.7%)	19 (33.9%)	14 (2.2%)	< 0.0001
Temporary pacing, n (%)	128 (18.2%)	12 (21.4 %)	116 (18.0%)	0.5189
Procedure time (min)	89.6±62.6	145.5±80.9	84.8±58.4	< 0.0001
TLE - transvenous lead extraction				

Table S5. Coexisting complications in the operative or postoperative period, with a univariate comparison between broken lead and non-broken lead in the TLE patients.

Variable	The entire group, n =702 patients	The broken lead during the TLE group, n = 56 patients	The non-broken lead during the TLE group, n = 646 patients	p-value

Bleeding requiring blood transfusion, n (%)	21 (3.0%)	3 (5.4%)	18 (2.8%)	0.2790
Venous thrombosis, n (%)	33 (4.7%)	4 (7.1%)	29 (4.5%)	0.3684
Pocket hematoma requiring evacuation, n (%)	10 (1.4%)	1 (1.8 %)	9 (1.4%)	0.8122
Pneumothorax requiring chest tube, n (%)	12 (1.7%)	2 (3.6 %)	10 (1.5%)	0.2628
Stroke during hospitalization, n (%)	2 (0.3%)	0 (0.0%)	3 (0.3%)	0.6769
Stroke according to TLE, n (%)	1 (0.1%)	0 (0.0%)	1 (0.2%)	0.7684
Acute Kidney Injury, n (%)	14 (2.0%)	4 (7.1%)	10 (1.5%)	0.0041
Myocardial Infarction during hospitalization, n (%)	2 (0.3%)	0 (0.0%)	2 (0.3%)	0.6769
Cardiac arrest, n (%)	16 (2.3%)	3 (5.4%)	13 (2.0%)	0.1079
Worsening tricuspid valve function according to TLE, n (%)	6 (0.9%)	1 (1.8%)	5 (0.8%)	0.4305
Vascular laceration (artery, veins, coronary sinus) requiring intervention, n (%)	9 (1.3%)	2 (3.6%)	7 (1.1%)	0.1127
Vascular repair at venous entry site, n (%)	5 (0.7%)	1 (1.8%)	4 (0.6%)	0.3197
Pericardial effusion requiring intervention, n (%)	13 (1.9%)	4 (7.1%)	9 (1.4%)	0.0022
Paracentesis, n (%)	9 (1.3%)	2 (3.6%)	7 (1.1%)	0.1127
Cardiosurgery, n (%)	10 (1.4%)	3 (5.4%)	7 (1.1%)	0.0097
Massive pulmonary embolism, n (%)	3 (0.4%)	0 (0.0%)	3 (0.5%)	0.6096
Periprocedural death, n (%)	4 (0.6%)	1 (1.8%)	3 (0.5%)	0.2079
TLE - transvenous lead extraction None of the myocardial infarctions was attributed to TLE.				

Table S6. Mortality and operative or postoperative effects with univariate comparison between broken lead and non-broken lead during TLE patients.

Variable	The entire group, n =702 patients	The broken lead during the TLE group, n = 56 patients	The non-broken lead during the TLE group, n = 646 patients	p-value
Lack of removal of all targeted leads, n (%)	52 (7.4%)	44 (78.6%)	8 (1.2%)	< 0.0001
Leaving a small part of the lead below 4cm, n (%)	30 (4.3%)	30 (53.6%)	0 (0.0%)	< 0.0001
Leaving a big part of the lead above 4cm, n (%)	22 (3.1%)	14 (25.0%)	8 (1.2%)	< 0.0001
Complete procedural success, n (%)	642 (91.5%)	32 (57.1%)	610 (94.4%)	< 0.0001
Clinical success, n (%)	671 (95.6%)	48 (85.7%)	623 (96.4%)	0.0002
Total duration of the hospital stay (days)	9.7±8.6	10.6±9.4	9.7±8.5	0.3202
30-day mortality, n (%)	20 (2.8%)	2 (3.6%)	18 (2.8%)	0.7350
TLE - transvenous lead extraction				

Table S7. TREND Statement Checklist

Paper Section/Topic	Item No.	Descriptor	Report ✓
TITLE and ABSTRACT			
Title and	1	• Information on how units were allocated to interventions	

Abstract				
		• Structured abstract recommended	X	
		• Information on target population or study sample	X	
INTRODUCTION				
Background	2	• Scientific background and explanation of rationale	X	2
		• Theories used in designing behavioral interventions		N
METHODS				
Participants	3	• Eligibility criteria for participants, including criteria at different levels in recruitment/sampling plan (e.g., cities, clinics, subjects)	X	3
		• Method of recruitment (e.g., referral, self-selection), including the sampling method if a systematic sampling plan was implemented	X	3
		• Recruitment setting	X	3
		• Settings and locations where the data were collected	X	3
Interventions	4	• Details of the interventions intended for each study condition and how and when they were actually administered, specifically including:		N
		○ Content: what was given?		N
		○ Delivery method: how was the content given?		N
		○ Unit of delivery: how were subjects grouped during delivery?		N
		○ Deliverer: who delivered the intervention?		N
		○ Setting: where was the intervention delivered?		N
		○ Exposure quantity and duration: how many sessions or episodes or events were intended to be delivered? How long were they intended to last?		N
		○ Time span: how long was it intended to take to deliver the intervention to each unit?		N
		○ Activities to increase compliance or adherence (e.g., incentives)		N
Objectives	5	• Specific objectives and hypotheses	X	2
Outcomes	6	• Clearly defined primary and secondary outcome measures	X	3
		• Methods used to collect data and any methods used to enhance the quality of measurements	X	3
		• Information on validated instruments such as psychometric and biometric properties		N
Sample size	7	• How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules		N
Assignment method	8	• Unit of assignment (the unit being assigned to study condition, e.g., individual, group, community)		N
		• Method used to assign units to study conditions, including details of any restriction (e.g., blocking, stratification, minimization)		N
		• Inclusion of aspects employed to help minimize potential bias induced due to non-randomization (e.g., matching)		N
Blinding (masking)	9	• Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to study condition assignment; if so, statement regarding how the blinding was accomplished and how it was assessed		N
Unit of Analysis	10	• Description of the smallest unit that is being analysed to assess intervention effects (e.g., individual, group, or community)	X	3
		• If the unit of analysis differs from the unit of assignment, the analytical method used to account for this (e.g., adjusting the standard error estimates by the design effect or using multilevel analysis)		N
Statistical methods	11	• Statistical methods used to compare study groups for primary methods outcome(s), including complex methods for correlated data	X	5
		• Statistical methods used for additional analyses, such as subgroup analyses and adjusted analysis	X	5
		• Methods for imputing missing data, if used		N
		• Statistical software or programs used	X	5
RESULTS				

Participant flow	12	• Flow of participants through each stage of the study: enrollment, assignment, allocation and intervention exposure, follow-up, analysis (a diagram is strongly recommended)	X
		○ Enrollment: the numbers of participants screened for eligibility, found to be eligible or not eligible, declined to be enrolled, and enrolled in the study	
		○ Assignment: the numbers of participants assigned to a study condition	
		○ Allocation and intervention exposure: the number of participants assigned to each study condition and the number of participants who received each intervention	
		○ Follow-up: the number of participants who completed the follow-up or did not complete the follow-up (i.e., lost to follow-up), by study condition	
		○ Analysis: the number of participants included in or excluded from the main analysis, by study condition	
		• Description of protocol deviations from study as planned, along with reasons	
Recruitment	13	• Dates defining the periods of recruitment and follow-up	X
Baseline data	14	• Baseline demographic and clinical characteristics of participants in each study condition	X
		• Baseline characteristics for each study condition relevant to specific disease prevention research	
		• Baseline comparisons of those lost to follow-up and those retained, overall and by study condition	
		• Comparison between study population at baseline and target population of interest	X
Baseline equivalence	15	• Data on study group equivalence at baseline and statistical methods used to control for baseline differences	
Numbers analyzed	16	• Number of participants (denominator) included in each analysis for each study condition, particularly when the denominators change for different outcomes; statement of the results in absolute numbers when feasible	X
		• Indication of whether the analysis strategy was “intention to treat” or, if not, description of how non-compliers were treated in the analyses	
Outcomes and estimation	17	• For each primary and secondary outcome, a summary of results for each estimation study condition, and the estimated effect size and a confidence interval to indicate the precision	X
		• Inclusion of null and negative findings	X
		• Inclusion of results from testing pre-specified causal pathways through which the intervention was intended to operate, if any	
Ancillary analyses	18	• Summary of other analyses performed, including subgroup or restricted analyses, indicating which are pre-specified or exploratory	X
Adverse events	19	• Summary of all important adverse events or unintended effects in each study condition (including summary measures, effect size estimates, and confidence intervals)	X
DISCUSSION			
Interpretation	20	• Interpretation of the results, taking into account study hypotheses, sources of potential bias, imprecision of measures, multiplicative analyses, and other limitations or weaknesses of the study	X
		• Discussion of results taking into account the mechanism by which the intervention was intended to work (causal pathways) or alternative mechanisms or explanations	X
		• Discussion of the success of and barriers to implementing the intervention, fidelity of implementation	
		• Discussion of research, programmatic, or policy implications	X
Generalizability	21	• Generalizability (external validity) of the trial findings, taking into account the study population, the characteristics of the intervention, length of follow-up, incentives, compliance rates, specific sites/settings involved in the study, and other contextual issues	X
Overall evidence	22	• General interpretation of the results in the context of current evidence and current theory	X

From: Des Jarlais, D. C., Lyles, C., Crepaz, N., & the Trend Group (2004). Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: The TREND statement. *American Journal of Public Health*, 94, 361-366. For more information, visit: http://www.cdc.gov/trendstatement/