PROMET: The effect of operator profession on non-laser transvenous lead extraction

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Background: As implantation of cardiac implantable devices (CIED) rises globally, there is a paralleled need for extraction of these devices. Indications for transvenous lead extraction (TLE) is expanding, fuelling demand. This lifesaving procedure is performed by cardiologists and cardiac surgeons (CS). Cardiologists are familiar with transvenous methods whilst cardiac surgeons possess the skillset to address the significant complications associated with this procedure.

We compared non-laser TLE outcomes performed by cardiologists and cardiac surgeons from six high-volume extraction centres across Europe.

Methods: Data was collected retrospectively from six major European TLE centres of 2205 patients and 3849 leads (PROMET). Propensity 1:1 score matching (PSM) was performed to account for confounding variables. PSM model with variables: lead dwell time, infection indication, biventricular system and defibrillator device, was best matched. This dataset was analysed to compare outcomes of TLE performed by the cardiologists and CS. Predictors of 30-day mortality and complications were identified using a multivariate regression analysis.

Results: Patients treated by CS and cardiologists were similar in age (64.7 vs 66.7 years, p = NS) and equally male (70.3% vs 72.3%, p = 0.39) with a parallel infectious indication (51.7% vs 47.6%, p = 0.1). Surgeons achieved a significantly higher proportion of clinical success than cardiologists (98.9% vs 96.4%, p = 0.001) and complete lead extraction (98% vs 95.9%, p < 0.01) with a higher rate of minor complications (4.1% vs 2.2%, p = 0.024); major complications were similar (0.9% vs 1.2%, respectively, p = 0.46) as was 30-day mortality (3.2% vs 2%, respectively, p = 0.28). Multivariate regression analysis revealed systemic infection (p < 0.001, OR 7.2 [CI 2.3-20.1]) and defibrillator system extraction (p = 0.025, OR 3.4 [CI 1.2-10.2]) increased the odds of 30-day mortality, whilst Evolution™ sheath use reduced the odds (p = 0.025, OR 0.34 [CI 0.13-0.88]); lead dwell time (p = 0.02, OR 1.005 [1-1.009] and Evolution™ sheath use (p = 0.023, OR 2.15[1.1-4.15]) increased the odds of complications.

Conclusion: Cardiac surgeons and cardiologists achieved a high rate of TLE procedural success and with a similar safety profile, replicating standards seen across Europe.