Unearthing the Evidence: Post-Mortem Interrogation of Cardiac Implantable Electronic Devices

T. Block, E. Paratz, A. La Gerche, D. Stub, N. Strathmore, H. Mond, P. Kistler, J. Kalman, M. Burke, A. Voskoboinik

1 Austin Health, Heidelberg, Vic, Australia
2 Department of Diabetes, Central Clinical School, Faculty of Medicine Nursing and Health Sciences, Monash University, Melbourne, Vic, Australia
3 Baker Heart and Diabetes Institute, Melbourne, Vic, Australia
4 Department of Cardiology, Alfred Hospital, Melbourne, Vic, Australia
5 St Vincent’s Hospital Melbourne, Fitzroy, Vic, Australia
6 Department of Public Health and Preventive Medicine, Monash University, Melbourne, Vic, Australia
7 Department of Cardiology, Royal Melbourne Hospital, Melbourne, Vic, Australia
8 Department of Medicine, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Melbourne, Vic, Australia
9 Department of Medicine, Faculty of Medicine, Nursing and Health Sciences, Monash University, Clayton, Vic, Australia
10 Department of Cardiology, Cabrini Hospital, Malvern, Vic, Australia
11 Victorian Institute of Forensic Medicine, Southbank, Vic, Australia
12 Department of Cardiology, Western Health, St Albans, Vic, Australia

Background: The diagnostic yield of post-mortem interrogation of cardiac implantable electronic devices (CIEDs) including pacemakers, defibrillators and implantable loop recorders has not been well described.

Methods: We reviewed all post-mortem CIED interrogations performed by the Victorian Institute of Forensic Medicine between 2005-2020 for investigation of sudden or unexplained death.

Results: 260 patients (69.8% male, median age 73.2 years [IQR 63.2-82.3]) underwent post-mortem CIED interrogation (202 pacemakers, 56 defibrillators and 2 loop recorders). CIEDs were implanted for a median of 2.0 [IQR 0.75-5] years, with 19 devices requiring replacement (and 4 end of life). Post-mortem interrogation was successful in 256 (98.5%) cases: untreated ventricular arrhythmias (n=17), battery depletion (n=6), and lead failure (n=2). CIED interrogation directly informed cause of death in 130 (50.0%) cases, with fatal ventricular arrhythmias identified in 121 patients (46.5%). 71 (27.3%) patients had abnormalities recorded by their device in the 30 days preceding death: non-sustained ventricular tachycardia (n=26), rapid atrial fibrillation (n=17), longevity concerns (n=23), intrathoracic impedance alarms (n=3), lead issues (n=1) or therapy delivered (n=1). In 6 cases where the patient was found deceased after a prolonged time, CIED interrogation accurately determined time of death. In one case, CIED interrogation was the primary method of patient identification.

Conclusion: Post-mortem CIED interrogation frequently contributes important information regarding critical device malfunction, pre-mortem abnormalities, cause and time of death or patient identity. Device interrogation should be considered for select patients with CIEDs undergoing autopsy.

https://doi.org/10.1016/j.hlc.2021.06.030

Indigenous Health Prize Finalists (028–029)

Long-term Outcomes in Indigenous Australians Following Coronary Artery Bypass Surgery


1 Department of Cardiology, Alfred Health, Melbourne, Vic, Australia
2 Central Clinical School, Monash University, Melbourne, Vic, Australia
3 Department of Cardiology, Royal Melbourne Hospital, Melbourne, Vic, Australia
4 Centre for Cardiovascular Research and Education (CCRE) in Therapeutics, Monash University, Melbourne, Vic, Australia
5 Cardiothoracic Surgical Unit, Flinders Medical Centre and Flinders University, Adelaide, SA, Australia
6 Cardiothoracic Surgery, St Vincent’s Clinical School Department of Surgery, University of Melbourne, Melbourne, Vic, Australia
7 Departments of Surgery, Monash University and of Cardiothoracic Surgery, Monash Medical Centre, Melbourne, Vic, Australia
8 School of Public Health, Curtin University, Perth, WA, Australia

Background: Though mortality rates from cardiac conditions are decreasing for Indigenous Australians, they remain significantly higher than for non-Indigenous Australians. Whether this difference persists after coronary revascularisation is unclear. We sought to evaluate whether Indigenous status impacts upon long-term outcome following isolated coronary artery bypass surgery (CABG).

Methods: The outcomes of 1,648 Indigenous Australians (55±10 years; 32% female) enrolled in the ANZSCCTS registry were compared to 58,602 non-Indigenous Australians (66±10 years; 20% female) following CABG. In a secondary analysis, patients were propensity-matched (1:1) by age, sex, renal function, diabetes, smoking status, prior stroke or myocardial infarction (MI), and left ventricular ejection fraction (1,528 in each group).

Results: Indigenous Australians were younger, more likely to be female, current smokers, have diabetes, dyslipidaemia, hypertension, heart failure, and prior MI (all