Objective: We aim to investigate the feasibility and safety of a custom made system for remote programming of CIEDs in clinically relevant situations.

Methods: Our remote programming solution consists in remote controlling CIEDs programmer through screen capture and remote cursor control. This approach has the advantages to preclude unauthorized access to the CIED, to prevent alteration of the programmer and to be multivendor compatible. In this multicenter feasibility study the primary outcome was the percentage of successful remote interrogation and programming of patients requiring a device check-up or programming intervention.

Results: Device cardiologists performed in-hospital (Bordeaux University Medical Center; \(N = 49\)), medium-range (100 km at non-academic center; \(N = 10\)), and intercontinental programming (>5000 km; \(N = 6\)) of 65 patients (56% pacing dependent). Implanted devices were pacemakers (74%) and ICDs (26%) from Biotronik\textsuperscript{TM} (N = 42), Micropor\textsuperscript{TM} (N = 18), and Abbott\textsuperscript{TM} (N = 5). The patients were located in the outpatient clinic, device clinic, operating room (per-implantation), emergency department and MRI preparation room. Device cardiologists worked from home in 14 cases. Full CIED interrogations succeeded in 100% of cases with programming changes effectuated in 62%. The mean time lag for programmer screen interaction was 0.6 ± 0.7 seconds. No clinical or technical complications occurred.

Conclusion: Remote programming is feasible and enables safe interrogation and reprogramming of CIEDs in various conditions and distances. This strategy may enhance health care access and facilitate medical training, tele-expertise and tele-work.

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PREDICTORS AND OUTCOMES OF LEAD PERFORATION IN A UNITED KINGDOM MULTICENTRE SERIES - THE DIAGNOSTIC VALUE OF HIGH-RESOLUTION COMPUTED TOMOGRAPHY

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Background: Iatrogenic cardiac perforation due to pacemaker (PM) & implantable cardioverter-defibrillator (ICD) leads is a rare but serious complication. Clinical features vary widely at times causing diagnostic delay. Management strategies and are non-guideline based due to paucity of data.

Objective: To review the incidence, clinical features, management, and outcomes of PM/ICD lead cardiac perforation in a contemporary multi-centre study.

Methods: This study is a multicentre retrospective series including 3 United Kingdom cardiac tertiary centres from 2016-2020. Patient, device & lead characteristics were obtained including outcomes at 6 months.

Results: Seventy cases of perforation were identified from 10,631 procedures; perforation rate was 0.50% for local implants. 39 (56%) patients were female, mean age 74 (±13.8) years. Mean left ventricular ejection fraction 51 (±13.2) %. Mean time to diagnosis 9 (range 0-989) days. Computed tomography (CT) imaging diagnosed perforation with a sensitivity of 97%. Management strategy was percutaneous in 98.6% with complete procedural success in 98.6%. Lead parameter abnormalities were present in 86% (whole cohort) and 98.6% for perforations diagnosed >24hours. Chest pain was the commonest symptom, present in 46%. Pericardial effusion with tamponade was present in 17% and was associated with significantly increased mortality and major complications. Anticoagulation status at perforation diagnosis was associated with tamponade at presentation by multivariate analysis, odds ratio 16.1 (\(p = 0.028, 95\%\) confidence interval: 1.4 - 192.4).

Conclusion: Perforation was rare (0.50%) within this cohort and managed successfully by a percutaneous strategy. Cardiac CT was highly sensitive for a perforation diagnosis. The presence of tamponade was associated increased risk of 30-day mortality and major complications. Case complexity is highly variable and requires both skilled operators and multi-disciplinary management to achieve good outcomes.

Computed tomography post contrast displaying lead tip perforation localization with review in three orthogonal views: A + B: coronal planes, C: axial plane and D: sagittal plane. All demonstrating the lead tip (denoted by *) traversing beyond the visceral pericardium and likely abutting the parietal pericardium, visible even with some motion artefact.