

A multi centre UK experience with optimal site implantation of a wireless intracardiac LV endocardial electrode (WiCS-LV) for delivery of cardiac resynchronisation therapy.

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Introduction: A significant minority of patients fail to derive clinical benefit from cardiac resynchronisation therapy (CRT) delivered via an epicardial LV lead and many patients requiring an upgrade can have unfavourable central or coronary venous anatomy. CRT delivered through LV endocardial stimulation has demonstrated superior haemodynamic and electrical properties; access to the entire myocardium presents additional opportunity to identify the optimal LV site.

Purpose: The WiCS-LV pacing system is CE marked for patients who fail to derive benefit from conventional CRT or with difficult venous anatomy. We evaluated its clinical use in a multicentre registry.

Methods: 24 patients (70±8years, 23% female, 38% ischaemic, 60% NYHA III) underwent WiCS-LV implantation at 3 centres. Mean LVEF 23±16%, 6-minute walking distance 252±110 metres and Minnesota Living with Heart Failure questionnaire (MLHFq) score 47±23. Indications were LV lead failure/displacement (46%), unfavourable central or coronary sinus (CS) anatomy (16%), upgrade from existing pacing system (30%) & non-response to conventional CRT (8%). Target site selection included pre-operative speckle-tracking echocardiography & LV contact mapping with measurement of electrical (QLV/paced QRS) and acute haemodynamic responses (AHR, dP/dt) to biventricular pacing.

Results: All implants were successful. Procedure duration was 120±68mins, radiation dose 1722±1471cGym². 2.7±2.2 LV endocardial sites were tested per patient. Targeted, final implantation sites were anterolateral (7), lateral (4), inferolateral (8) and inferior (5). Mean Q-LV was 125ms (range 49-240). AHR improved by 17±14% vs baseline (p=0.003). QRS duration shortened from 162±23 to 131±25ms with biventricular pacing using the WiCS-LV electrode (p<0.001)(Figure). There were no cases of phrenic nerve stimulation (PNS). At 1 month, 22 (92%) cases achieved biventricular capture with significant reduction in MLHFq score to 14±13 (p=0.006) and increase in LVEF by 9±6%(p=0.005). There were 2 vascular complications related to the endocardial electrode, both related to closure of the 12F femoral arterial puncture requiring repair; one pocket infection which necessitated battery explant and reimplantation 2 months later and one failure of the electrode to be tracked by the transmitter.

Conclusion: The WiCS-LV system offers a feasible alternative for patients who fail to derive benefit from conventional CRT. The ability to target the LV endocardium irrespective of coronary venous anatomy, without any incidence of PNS is a unique advantage. Longer term clinical outcomes are awaited.

Change in QRS duration

