LV LEAD REVISION RATES HAVE NOT DECREASED ALONGSIDE THE IMPROVEMENT IN PROCEDURAL SUCCESS RATES FOR CARDIAC RESYNCHRONISATION THERAPY

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Introduction and Methods: The left ventricular lead required for CRT is challenging to place and can displace requiring revision. We investigated the change in the rates of left ventricular lead procedural success and the rate of subsequent need for LV lead revision over time. A literature search was used to identify all studies reporting success rates of CRT implantation via the Coronary Sinus (CS) route. Studies were ascribed to their year of starting recruitment in order to evaluate temporal trends, which were assessed with linear regression. Follow-up time and LV lead revision rates (expressed as percentage of patients per year) were recorded as a secondary outcome.

Results: 155 relevant studies were identified for the full analysis, including 26,488 patients: 75% male, aged 66 ± 11 years, NYHA class 2.8 ± 0.8, LV EF 26 ± 10%, QRS 156 ± 31 ms. Within these, 81 studies (13,663 patients, 52% of total) reported lead revision rates over a mean follow up of 8.0 months (range 1-24 months), representing 7798 patient-years of follow-up. Studies following patients for 1-3, 3-6 and 6-12 months reported statistically similar lead revision rates (4.7% p.a., 4.7%, 4.5%), but studies with over 12 months follow up reported more frequent lead revision (6.4%, P < 0.001 versus <12m). Failure rates of LV lead placement decreased steadily (−0.5% ± 0.09% per year, R² 0.18, P for non-zero change <0.001). Lead revision decreased when considered over the whole time period (−0.37% ± 0.1% per year, R² 0.5, P 0.003). Significant decrease in lead revision rates was seen only before 2000, and there was no significant change after that year (P 0.16). This was not the case for failure to place a lead which continued to decrease significantly (P 0.001). These findings persisted after adjustment of lead displacement rates for follow-up duration.

Conclusions: The reported rate of failure to implant an LV lead via the coronary sinus has decreased steadily over the years after the introduction of CRT, likely due to a combination of increasing operator experience and improved lead and delivery system technology. Lead revision rates improved significantly in the initial few years of CRT, but have not apparently changed significantly since about the year 2000. Further development of lead technology and implant techniques should aim to improve lead displacement.

Figure 1 Rate of failure to place a left ventricular lead and rate of lead revision.