

Success and failure for implantation of left bundle branch pacing using stylet-driven pacing leads : a single center experience

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Background/Introduction :Left bundle area pacing is a new modality of physiological pacing. By screwing the pacing lead deep into the inter-ventricular septum, the left bundle branch could be recruited for pacing purpose. Initially left bundle area pacing was performed with fixed helix lead supported by the delivery catheter. On the other hand, there are studies showing the feasibility of using a style-driven extendable helix with the new delivery sheath for left bundle area pacing.

Purpose :To study the feasibility of left bundle area pacing and explore factors associated with success and failure

Methods :This is a retrospective study from September 2020 to January 2021 in a local hospital. Baseline patient characters, procedural characters, acute complication and reason for failure were recorded. Logistic regression was done to explore factors associated with success and failure.

Results :In 14 patients, the mean age is 81 +/- 6.8 years with 28% female. Pacing indications were sick sinus syndrome (n = 3) and atrio-ventricular block (n = 11). The success rate is 64% (n = 9/14). The average R wave sensing was 11.4 +/- 4.5mV, the average V pacing threshold was 0.88 +/- 0.23V @ 0.4ms and average impedance was 633 +/- 93.6 Ohm. There were no septal perforation nor pericardial effusion after implantation. The most common reason for failure is lead dislodgement during implantation (n = 4) and the other reason is failure to locate and capture the left bundle (n = 1). In logistic regression, there was no clinical risk factor identified to predict failure for implantation, i.e. diabetics (OR 0.95, p = 0.15), hyperlipidaemia (OR 0.87, p = 0.94), chronic renal disease (OR 0.88, p = 0.94), coronary heart disease (OR 0.37, p = 0.66). Gender (OR 4.5, p = 0.37), age (OR 1.1, p = 0.32) and hypertension (OR 25, p = 0.25) may appear to predict failure for implantation but the results were not statistically significant.

Conclusion :Left bundle area pacing could be feasible and safely implanted using style-driven lead with good pacing parameters. No clinical factor is identified to predict the failure of implantation, the main reason for failure is dislodgement of lead during implantation. Similar finding was noted in a study comparing lumen-less lead and stylet-driven lead.² In this study found that reason for failure of left bundle area pacing using style-driven lead was due to repetitive lead dislodgement after slitting the delivery sheath, fail advancement of lead into septum and loose septal endocardium. Stability and ability to screw into septum remain a great obstacle for left bundle area pacing using stylet-driven lead. This study is limited by small sampling size and single center retrospective study. Further studies are needed to see the long term outcome of left bundle area pacing using style-driven lead and investigate other methods to predict success/ failure of implantation, such as the role of imaging.