Predicting factor of septal implantation of a leadless pacemaker by left and right anterior oblique view

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Introduction: Leadless pacemaker implantation has a risk of cardiac perforation. Midseptal implantation was optimal method to reduce the complication. We usually checked left anterior oblique (LAO) view and right anterior oblique (RAO) view to confirm septal position. It was reported that left lateral (LL) view was useful for confirmation of septal position but we can't always check LL view during procedure due to mechanical problem, patient’s physical constitution, and so on. We hypothesized that LAO/RAO device length ratio and LAO device spinal angle related to septal implantation defined by LL view. We examined these values for predicting factor of septal implantation confirmed by LL view.

Methods: We retrospectively analyzed 42 consecutive patients who underwent leadless pacemaker implantation from September 2017 to September 2018. We implanted leadless pacemaker by LAO and RAO view and confirmed septal direction. We checked LL chest radiography after the procedure. We defined septal implantation as straight to dorsal direction by LL view. We measured LAO/RAO device length ratio and LAO device spinal angle and evaluated correlation of these factors and septal implantation confirmed by LL chest radiography.

Result: We excluded the cases with missing data leading to 38 patients (60.5% male, mean age 81.6 ± 10.4 years old) for analysis. Septal implantation confirmed by LL chest radiography was achieved in 6 patients (15.8%). The LAO/RAO device length ratio was significantly higher in these patients (0.87 ± 0.09 vs. 0.60 ± 0.15, p<0.001). But there was no correlation between septal implantation and LAO device spinal angle (50.4 ± 21.8 vs. 33.4 ± 23.6, p=0.11). We measured LL view device angle (straight as 0, dorsal direction as +, abdominal direction as -) and evaluated the correlation between the LAO/RAO device length ratio and the LL view device angle. There was strong correlation ($r=0.87$, 95%CI 0.76-0.93, p<0.001).

Conclusion: LAO/RAO device length ratio may be a predicting factor of septal implantation confirmed by LL view.