Influence of QRS Infarct Score and QRS Duration prior to Transcatheter Aortic Valve Replacement on Follow-up Left Ventricular End Systolic Volume in Patients with New Persistent Left Bundle Branch Block

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INTRODUCTION New-onset left bundle branch block (LBBB) is a known complication during transcatheter aortic valve replacement (TAVR) and occurs in approximately 30% of patients. This study evaluated the influence of pre-TAVR cardiac conditions on left ventricular function in patients with new persistent LBBB post-TAVR.

METHODS This is a retrospective study utilizing information from Duke University Medical Center clinical databases between April 2011 and May 2014. Only 11 patients qualified for this study because of strict inclusion criteria. For the evaluation of LBBB we used the criteria for strict LBBB by Strauss et al. Pre-TAVR electrocardiograms were evaluated for Selvester QRS infarct score and QRS duration, and 6-12 months post-TAVR left ventricular end-systolic volume (LVESV) was used as the outcome variable for determining left ventricular function.

RESULTS This study included 7 males and 4 females with a mean age of 81 ± 7.7 years. The mean QRS score pre-TAVR was 2.4 ± 2.6 points, QRS duration 104 ± 12.5 ms and LVESV 37 ± 25.3 mL. There was a positive correlation between QRS score and LVESV of r= 0.59 *(p = 0.058)*, but there was no relationship between QRS duration and LVESV, r= -0.18 (*p = 0.59*). However, dividing patients into groups of QRS scores (Figure 1A) and QRS durations (Figure 1B) showed that patients with either a higher QRS score or a shorter QRS duration have an increase in LVESV.

DISCUSSION When performing TAVR, it is possible that the left bundle branch becomes sufficiently traumatized to interrupt its conduction fibers to cause persistent LBBB. This study showed that patients with this complication and higher pre-TAVR QRS infarct score (5-6 points) have worse post-TAVR left ventricular function. This is most likely caused by higher scar burden detrimental to effective compensation for the LBBB. However, pre-TAVR QRS duration has no such predictive value for change in LVESV. Because this study is only hypothesis generating, larger studies should further evaluate the effect of both QRS score and QRS duration on left ventricular function in patients with new-persistent LBBB after TAVR.

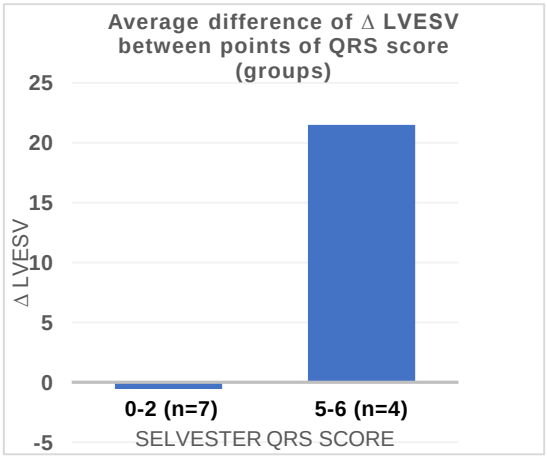

Figure 1A. Two groups of QRS score and the average ΔLVESV in mL(p = 0.158).

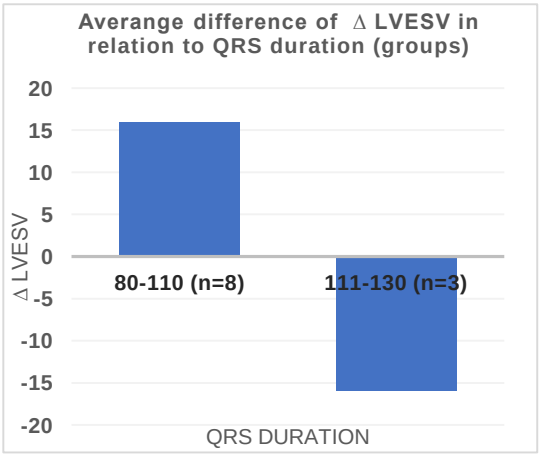

Figure 1B. Different groups of QRS duration and the average ΔLVESV in mL(p = 0.054).