Resolution of RBBB during Transient Total AV Block: Proposed Mechanism

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Introduction: Right bundle branch block (RBBB) is a condition when left ventricle is depolarized first before right ventricle. Two types of RBBB can be distinguished, anatomical and functional. In anatomical RBBB, the conduction to the right bundle is severed and cannot deliver any impulse propagation. Functional RBBB is due to longer refractory period. When impulse arrived with longer interval, it can propagate via the right bundle.

Methods: N/A.

Result: A 53-year-old man was referred to our center due to TAVB for PPM implantation. The ECG showed no TAVB but a baseline RBBB and slight PR prolongation. (Figure A) During observation, we found that TAVB do occur transiently and show recovery of RBBB, but with LAFB morphology. (Figure B)

Conclusion: We proposed that Left Anterior Fasicle (LAF) was already defected and gave slower conduction. During sinus rhythm, the Right Bundle Branch (RBB) and Left Posterior Fasicle (LPF) were functionally blocked, and have two consequences. First, the slowing of LPF makes the impulse from LAF and LPF arrives simultaneously. (Figure C, red circle) Second, the slowing of RBB propagation makes the right ventricle to be activated transeptally from the left ventricle. (Figure C, blue circle) The slower firing rate of AV nodal pacemaker allow RBB to recover and reveal that patient’s RBBB is functional rather than anatomical. (Figure D, red circle) This slower impulse also allows LPF to recover (Figure D, blue circle), revealing a diseased LAF. The ability of the impulse to penetrates into right bundle and left posterior fascicle shows us that the block was more likely to be supraventricular. A lower level block would likely result in ventricular escape origin and result in wider QRS morphology. (Figure E)